Cycle®

SEPTEMBER 1978 • 75 CENTS

BIMOTA/SUZUKI SB2: $8000, AND WORTH IT

TESTS: SUZUKI PE175 ENDURO

KAWASAKI KX250 A4

HONDA XL175 DUAL-PURPOSE

YAMAHA SR500E HOP-UP PART 2

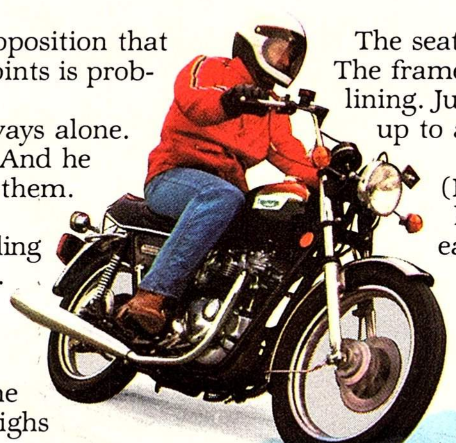
GERRIT WOLSINK LOSES USGP!

IS MOTORCYCLE INSURANCE A DEAD-END STREET?

THE SPECIAL MAGIC OF THE CALIFORNIA CUSTOM

0 09
1/024 14277
Cycle

NO MOTORCYCLE ON EARTH FOLLOWS DIRECTIONS LIKE A TRIUMPH.



Triumph is dedicated to the proposition that the shortest distance between two points is probably the most boring distance.

Man does not live by straightaways alone.

He needs curves. Lots of them. And he needs a motorcycle that can handle them. A motorcycle like Triumph.

How do you build the best handling Legend on earth? Thinking thin helps.

Our classic Vertical Twin, for instance, is the shortest, narrowest 750cc engine ever built. And it rides compactly in the narrowest 750 frame ever built. The entire motorcycle weighs an incredible 395 pounds dry.

The seat sits a mere 32 inches off the ground. The frame doubles as oil reservoir for streamlining. Just enough head angle and trail add up to an exact steering geometry.

And handsome Dunlop TT 100's (K-81's), maybe the world's best handling road tire, keep it all comfortably earthbound.

Building such a machine is no small accomplishment. It's the result of over 40 years of devotion to engineering detail, with more emphasis put on handling than anything else.

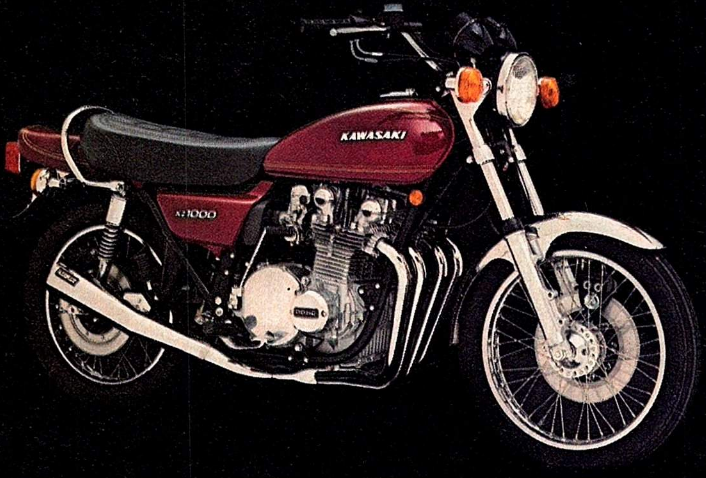
After all, The Legend would never steer you wrong.

TRIUMPH®

THE LEGEND LIVES ON

©Triumph Motorcycles America Inc. 177 W. Orangethorpe Avenue, P.O. Box 1060, Placentia, CA 92670
To locate your nearest Triumph dealer, call **(800) 824-5136 (Operator 68).** In California, call (800) 852-7631 (Operator 68).

CIRCLE NO. 22 ON READER SERVICE PAGE.



THE KERKER® EXHAUST SYSTEM

a Kerker® makes the motorcycle.

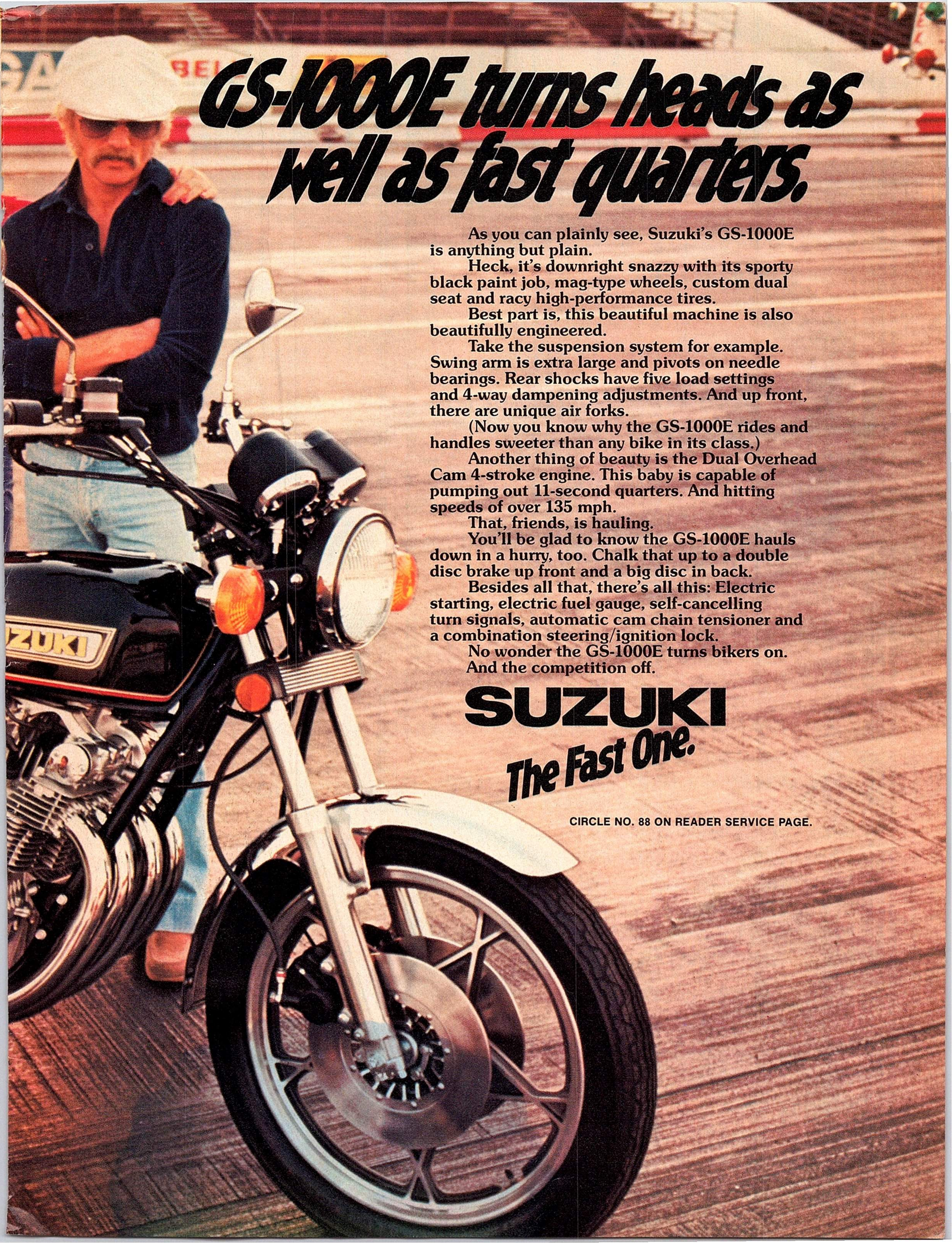
The high performance system designed to fit Kawasaki, Honda, Suzuki, and Yamaha multi-cylinder motorcycles. Available in black or chrome.

For full details see your dealer or contact:
Racecrafters International, Inc.
7801 Canoga Avenue/Canoga Park, California 91304
213-999-2811

Manufactured by Kerker Exhaust Systems
A division of Kendick Engineering, Inc.
7900 Deering Avenue/Canoga Park, California 91303
213-999-3060
Send $2.00 for brochure, patch, & decal to Kendick Eng.

CIRCLE NO. 80 ON READER SERVICE PAGE.

Ride safely: wear a helmet, eye protection and appropriate riding apparel.



GS-1000E turns heads as well as fast quarters.

As you can plainly see, Suzuki's GS-1000E is anything but plain.

Heck, it's downright snazzy with its sporty black paint job, mag-type wheels, custom dual seat and racy high-performance tires.

Best part is, this beautiful machine is also beautifully engineered.

Take the suspension system for example. Swing arm is extra large and pivots on needle bearings. Rear shocks have five load settings and 4-way dampening adjustments. And up front, there are unique air forks.

(Now you know why the GS-1000E rides and handles sweeter than any bike in its class.)

Another thing of beauty is the Dual Overhead Cam 4-stroke engine. This baby is capable of pumping out 11-second quarters. And hitting speeds of over 135 mph.

That, friends, is hauling.

You'll be glad to know the GS-1000E hauls down in a hurry, too. Chalk that up to a double disc brake up front and a big disc in back.

Besides all that, there's all this: Electric starting, electric fuel gauge, self-cancelling turn signals, automatic cam chain tensioner and a combination steering/ignition lock.

No wonder the GS-1000E turns bikers on.
And the competition off.

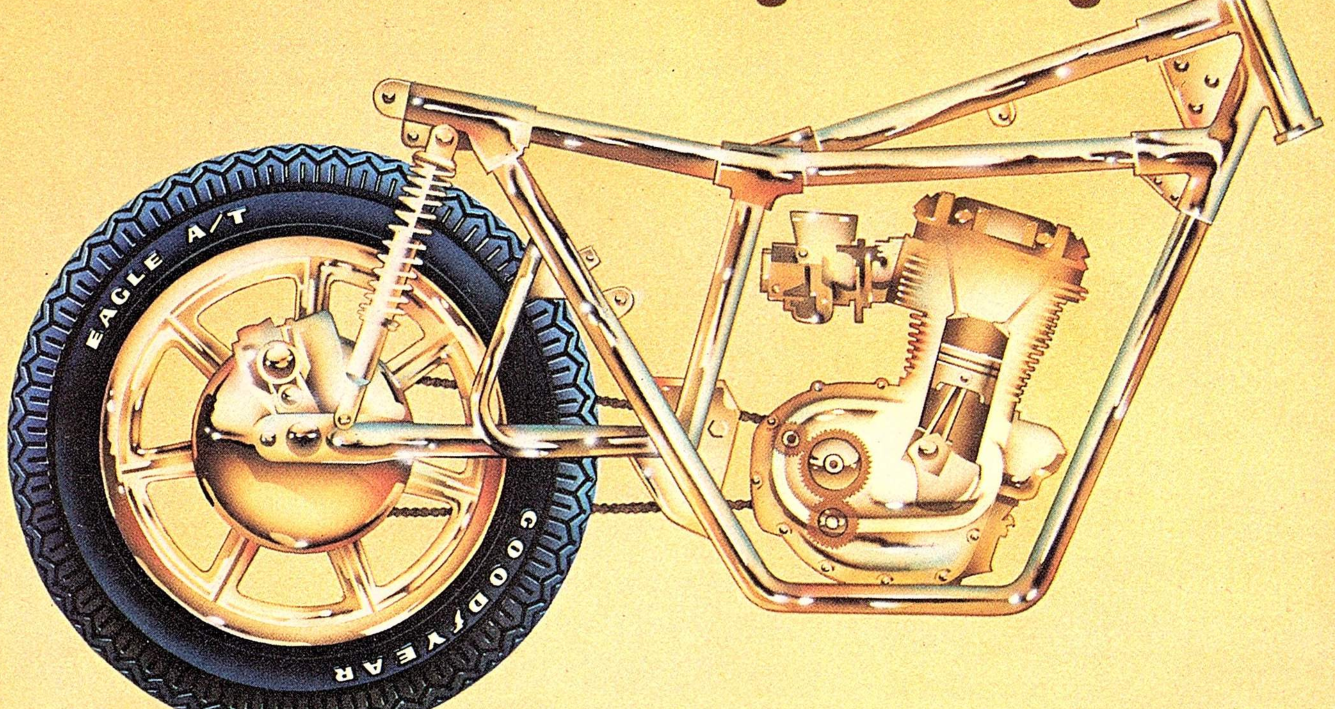
SUZUKI

The Fast One.

CIRCLE NO. 88 ON READER SERVICE PAGE.

EAGLE A/T

Built to run with a great design



The cylinders pump the power through the crank to the five-speed gear box. The rider picks the gear and sends the power to the rear wheel. This is the precise world of touring. But all of that design precision depends on the tire's footprint, a few square inches where the power is turned into motion. At Goodyear we know that. That's why we built the Eagle A/T tire to run with this great design. Here's how it works.

1. The carcass of the Eagle A/T is built with Goodyear's exclusive Triple-Tempered nylon, to help assure a tire strong enough to turn that touring power into touring miles.

2. The tread of the Eagle A/T is computer designed to handle wet and dry weather. It's always working, taking the power to the road, moving you down the road.

3. The Eagle A/T Tubeless, designed for the new light-weight mag wheels, gives you good looks and easy balancing and repairs.

4. The Eagle A/T is available in raised white letters or blackwall and carries a Goodyear speed rating of "H." It's a Goodyear Eagle and every Eagle tire is painstakingly engineered to work with a specific type of machine. Ask your Goodyear dealer to match your machine with a set of Eagles. They're built to run with the great designs.

GOODYEAR

Cycle®

September 1978 Volume XXIX No.9

Road Tests

36 Kawasaki KX250-A4
Why motocross starting lines are turning green
43 Honda XL175
Still the only small-displacement thumper you can buy
76 Suzuki PE175
Pro-level Enduro at an entry-level price

Features

28 The Bimota SB2
Outrageous and expensive. Incredible and expensive. Expensive and expensive
71 The Insurance Shell-Game
We have seen the enemy, but who is he? By Rich Taylor
104 The California Specials
Where function and money meet

Technical

48 Black Magic
God bless the sticky tire patch. By Kevin Cameron
55 Yamaha SR500E Hop-Up Part 2
Life on a drafty flow bench. By Gordon Jennings

Competition

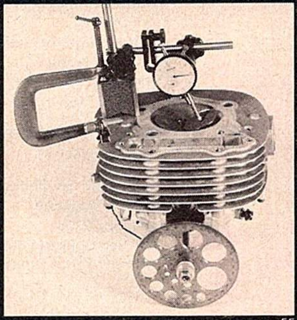
64 Carlsbad 500 Grand Prix: Heikki's Revenge
An American year, Almost. By Dave Hawkins

Departments

8 Letters / *Bring Back The Demo / Cook Neilson*
12 Duct Tapes / *Yorkshire Pudding And Bone Splinters / Ed Hertfelder*
16 Pipeline / *Punishment Without Crime / Jim Greening*
20 Newsline / *Spender's Corner / Bettina Costello*
24 Bits / *Varoom Splash Varoom Splash / Keith Code*
116 Classified Ads / *Goods And Services New And Used*
113 Reader's Information Service / *How To Find What You Saw*

p.76

p.36



p.55

P. Thomas Sargent, *Publisher*
Cook Neilson, *Editor*
Phil Schilling, *Executive Editor*
Dave Hawkins, *Associate Editor*
Don Phillipson, *Associate Editor*
Bill Stermer, *Associate Editor*
Bettina J. Costello, *Editorial Coordinator*
Allyn Fleming, *Editorial Assistant*
Bart Muhlfeld, *Shop Foreman*

Paul R. Halesworth, *Art Director*
Rob Wylder, *Assistant Art Director*

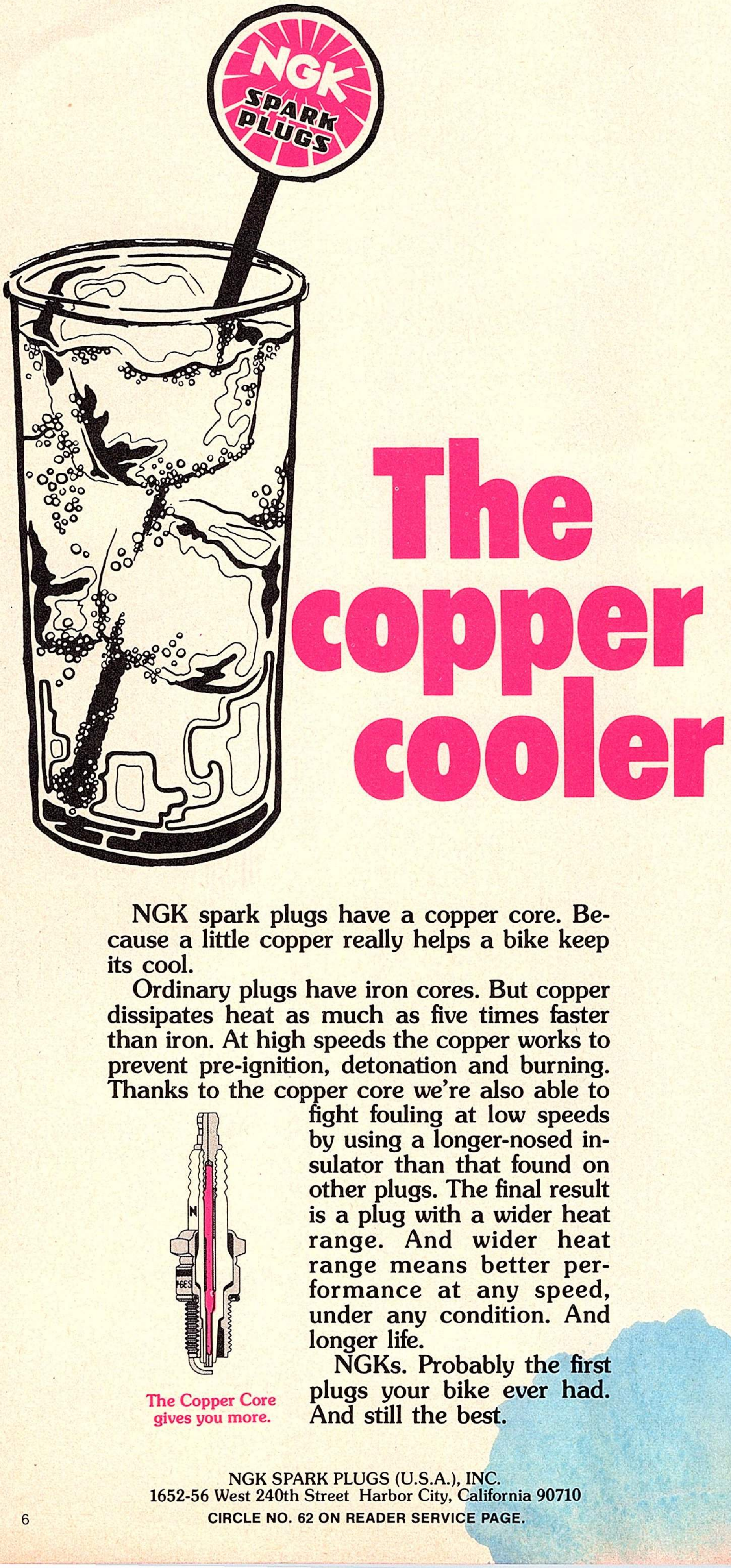
Irwin Germaine, *Production Director*

Gordon Jennings, *Contributing Editor*
Jim Greening, *Contributing Editor*
Kevin Cameron, *Contributing Editor*

Jack Kohr, *National Advertising Director*
Randy Pelton, *Western Sales Manager*
Jim Herring, *Eastern Sales Representative*
Brian J. Murphy, *Midwestern Sales Representative*
Jean Lee, *Advertising Assistant*

This Month's Cover: It's a bird, it's a plane, it's an Italian. Actually it's an Italian Bimota rolling chassis powered by a Suzuki GS-750 four-cylinder. The Bimota SB2 is the most glorious kit bike ever devised by welders of tubes, beaters of panels and officers of loan. For attracting attention, the SB2 is the best thing since sparkler-equipped handlebar streamers and flaming parrots. And for going fast, the Bimota SB2 is the best thing the money of most of us will ever buy. Feature begins on page 28.
Cover Photography: Dave Hawkins.

CYCLE September 1978, Volume 29, No.9. Published at One Park Ave., New York N.Y. 10016, by Ziff-Davis Publishing Company—also the publishers of Car and Driver, Flying, Skiing, Popular Photography, Stereo Review and Popular Electronics. One-year subscription rate for U.S. and Possessions $9.98. Canada $12.98, all other countries $14.98. Second class postage paid at New York, N.Y. and additional mailing offices. Authorized as second class mail by the Post Office Department, Ottawa, Canada, and for payment of postage in cash.
COPYRIGHT © 1978 BY ZIFF-DAVIS PUBLISHING CO. ALL RIGHTS RESERVED



The copper cooler

NGK spark plugs have a copper core. Because a little copper really helps a bike keep its cool.

Ordinary plugs have iron cores. But copper dissipates heat as much as five times faster than iron. At high speeds the copper works to prevent pre-ignition, detonation and burning. Thanks to the copper core we're also able to fight fouling at low speeds by using a longer-nosed insulator than that found on other plugs. The final result is a plug with a wider heat range. And wider heat range means better performance at any speed, under any condition. And longer life.

NGKs. Probably the first plugs your bike ever had. And still the best.

The Copper Core gives you more.

NGK SPARK PLUGS (U.S.A.), INC.
1652-56 West 240th Street Harbor City, California 90710
CIRCLE NO. 62 ON READER SERVICE PAGE.

Cycle

EDITORIAL CONTRIBUTION must be accompanied by return postage and will be handled with reasonable care; however, publisher assumes no responsibility for return or safety of artwork, photographs, models or manuscripts.

EXECUTIVE OFFICES
Ziff-Davis Publishing Company
One Park Avenue
New York, New York 10016
212/725-3500

EDITORIAL & PRODUCTION OFFICES
780-A Lakefield Road
Westlake Village, California 91361
213/889-4360

WESTERN OFFICE
Jack Kohr,
National Advertising Director
Randy Pelton,
Western Sales Manager
9025 Wilshire Blvd.
Beverly Hills, California 90211
213/273-8050

MIDWESTERN OFFICE
Brian J. Murphy,
Midwestern Sales Representative
180 N. Michigan Avenue
Suite 1400
Chicago, Illinois 60601
312/346-2600

EASTERN OFFICE
Jim Herring,
Eastern Sales Representative
One Park Avenue
New York, New York 10016
212/725-7462

Advertising Service Manager
Anne Speaker

CIRCULATION OFFICE
CYCLE Magazine
P.O. Box 2776
Boulder, Colorado 80323

MIC MPA AMA

ZD ZIFF-DAVIS PUBLISHING COMPANY
Editorial and Executive Offices
One Park Avenue, New York, New York 10016
212-725-3500

Philip B. Korsant	President
Furman Hebb	Executive Vice President
John R. Emery	Senior Vice President, Finance
Phillip T. Heffernan	Sr. Vice President
Edward D. Muhlfeld	Sr. Vice President
Philip Sine	Sr. Vice President, Secretary
Lawrence Sporn	Senior Vice President, Circulation and Marketing
Arthur W. Butzow	Vice President, Production
George E. Morrissey	Vice President
Sydney H. Rogers	Vice President
Sidney Holtz	Vice President
Albert S. Traina	Vice President
Paul H. Chook	Vice President
Edgar W. Hopper	Vice President
Robert N. Bavier, Jr.	Vice President
Charles B. Seton	Secretary
Selwyn Taubman	Treasurer
W. Bradford Briggs	Vice Chairman

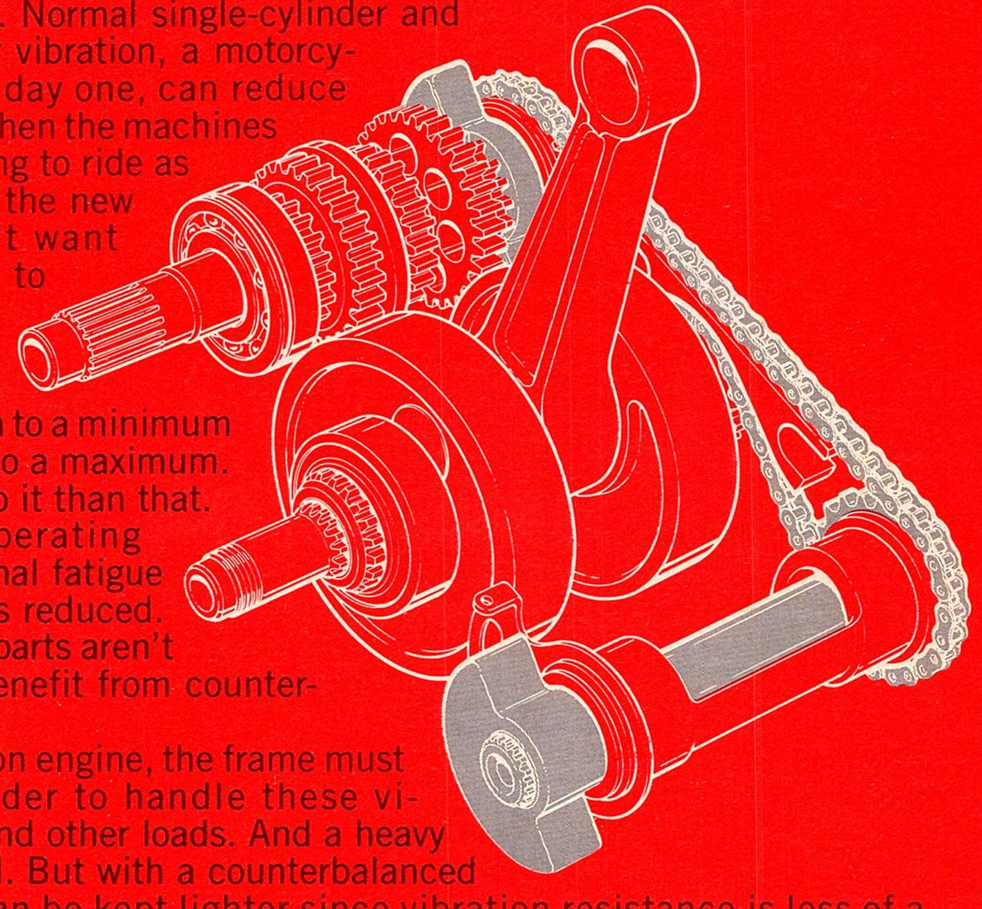
ZIFF CORPORATION
William Ziff, Chairman
I. Martin Pompadur, President
Hershel B. Sarbin, Executive Vice President

SUBSCRIPTION SERVICES Forms 3579 and all subscription correspondence should be addressed to Cycle, Circulation Department, P.O. Box 2776, Boulder, Colorado 80323. Please allow at least eight weeks for change of address. Include your old address, as well as new—enclosing, if possible, an address label from a recent issue.

Material in this publication may not be reproduced in any form without permission. Requests for permission should be directed to Jerry Schneider, Rights and Permissions, Ziff-Davis Publishing Company, One Park Avenue, New York, N.Y. 10016.

What's new from Honda?

Counterbalancers: Less vibration for you and your machine.



Honda has developed effective engine vibration-reducing counterbalancing systems for both the high-performance Hawk™ series and the spirited, lightweight XL-250S. Normal single-cylinder and vertical twin-cylinder vibration, a motorcycling nemesis since day one, can reduce riding comfort. And when the machines are as fun and exciting to ride as the Hawk series and the new XL-250S, you don't want excessive vibration to spoil your day. So, the Honda counterbalancing systems work to keep vibration to a minimum and your enjoyment to a maximum.

But there's more to it than that.

With smoother-operating engines, the vibrational fatigue of the engine parts is reduced. However, the engine parts aren't the only ones that benefit from counterbalancers.

With a high-vibration engine, the frame must be beefed up in order to handle these vibrational, torsional and other loads. And a heavy frame is no fun at all. But with a counterbalanced engine, the frame can be kept lighter since vibration resistance is less of a problem. This results in a lighter, more responsive, better handling machine. And one that's more fun to ride.

The Honda Hawk and XL-250S vibration counterbalancing systems are excellent examples of the thorough engineering and careful thought that go into every "First Into The Future" Honda. See them today at your Honda dealer and discover what it's like to ride without a whole lotta shakin' goin' on.

©1978 American Honda Motor Co., Inc.

HONDA

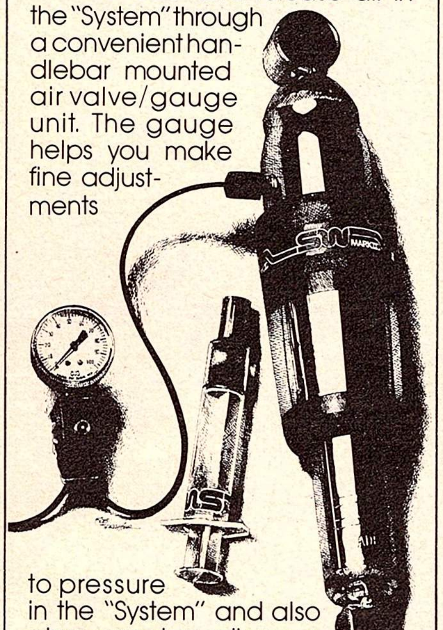
GOING STRONG!

Your bike should have come with them.

Since it didn't we think you're missing something. In fact, several somethings. Like uniform control, riding comfort, total suspension adjustability and simple convenience.

The new Mark II Air Adjustable System is totally and infinitely adjustable so that you can fine-tune your rear suspension to keep your bike's handling constant under all load conditions.

You add and release air in the "System" through a convenient handlebar mounted air valve/gauge unit. The gauge helps you make fine adjustments to pressure in the "System" and also gives exact readings so you easily pressurize the "System" for familiar loads. The optional pocket-size hand pump makes on-the-road pressure changes easy.



No conventional coil spring damper unit can compare to the S & W Mark II Air Adjustable System for safety, comfort and convenience.

We have a "System" to fit all major brand large displacement street/touring bikes including Harley-Davidsons and Hondas requiring clevis joint mounting. Shock units available in solid black or bright chrome plated.

A T-valve kit is supplied as standard equipment. The gauge and pump as illustrated, are optional.

S&W Engineered Products

Send $3.50 (Canadian $4.00) for 1978 Catalog/Engineering Handbook. This includes handling and mailing. California residents add 6% for sales tax.

P. O. Box 2007 Anaheim, CA 92804

CIRCLE NO. 48 ON READER SERVICE PAGE.

Letters

Bring Back the Demo

I'm not much on letter writing to magazines but I felt compelled to respond to Ed Ward's (the Honda salesman) letter in your July letters column. Mr. Ward complains about a prospective buyer's reliance on magazines for information. Mr. Ward fails to point out that our reliance on magazines such as yours is a direct result of dealers' policies concerning "test rides." I can't believe this guy's nerve! Ward maintains that we should "allow ourselves the opportunity to feel, push, pull and stuff through corners" a bike we are considering buying. Is this the same salesman who, undoubtedly, responds to requests for test rides with, "Are you serious, Sonny?"

When was the last time you were forced to plunk down $2500-$3500 for something you were not allowed to try out? (Why, the last time I bought a motorcycle!)

Without dealers providing demos our only way of getting seat-of-the-pants info, besides excellent magazines such as *Cycle,* is to wheedle, cajole or con someone into loaning us their bike. Not a very promising prospect. "Hey, mister, nice new CBX, mind if I take it for a . . . hey, come back!"

I think it's about time we attempted to put a stop to this ludicrous situation. If more of us would *insist* on test rides before buying, we would get them. The next time you are refused a legitimate request for a test ride try responding with a polite, "I guess I'll have to buy my bike elsewhere." If a goodly number of people in the market for a new bike did this, I think the drastic slump in sales would shake dealers out of their complacent attitude. This point would be reinforced when these dealers see the burgeoning sales records of dealers who wised up and provided demos for prospective buyers.

A couple of months of this (particularly during summer/high sales time) should cure this high-handed, archaic practice.

Ted Griffler
West Islip, New York

STAYING IN TOUCH

Just wanted to let you all know that I'm still out here.

O. H. McKagen
Hard Place, Idaho

BOUQUET

In regards to your "Gears for Two Wheels" article in the May issue—it is technical essays of this sort that make your magazine a productive and very worthwhile undertaking.

The ability of the author, Kevin Cameron, is remarkable in being able to pass on complex knowledge in a way that is both comprehensible and interesting to the layman.

Robert Epp
Brandon, Manitoba

NAGGING EXCLUSIVITY

I am a *Cycle* reader with minimal knowledge and experience of cycles. I learned to ride a rather small and dilapidated cycle in a parking lot two years ago without getting the chance to ride on the open road. However, that small taste of cycling (if I may take the license of calling it that) whetted my appetite for more, and I fantasize about buying a small cycle after I have learned to ride better. Therefore reading your magazine is very helpful in educating me further about cycles and how to ride them.

My disappointment, though, comes with the exclusivity of your magazine's language, photography, and riders. In the few months I have read your magazine, I have not seen or heard of any women riders. And your language seems to assume that your reading audience is all men. I've also noted that your advertisements are pitched toward men alone. Sexy women are usually posed by a virile-looking man, thereby endorsing the stereotypical macho image that Kendal Powe in his letter on page 10 of your June issue speaks of. This is offensive both to me and to the male riders I know who do not fit this image.

In conclusion let me say that I believe your magazine could be very instructive to both men and women cyclists. But I don't believe you will increase the number of women subscribers/readers without being sensitive to them. If I have overlooked any recent articles by women cycle riders, I hope you'll let me know. And I hope you'll respond to my criticism seriously. I would particularly like to see your Editorials use inclusive language, e.g., "he and she."

Sher L. Sweet
Durham, North Carolina

DUCK!

Now that I've ridden a Ducati and felt how a motorcycle should handle, it will be a long time before I ever own a Japanese

(Continued on page 10)

The Swiss Racing Watch, by AGON. $29.50

THE SWISS RACER.

Now you can own the same ultra-light accurate Swiss racing watch that has toured Europe. It was developed by Agon, the race engineering division of Economic Swiss Time (E.S.T.). This impact-resistant, high-stress watch can withstand racing temperatures and conditions. As a result of the introduction of Noryl miracle plastic, a space program by-product, the case and band have been reduced in weight to only one ounce. You'll notice the lightness results in ease of handling and comfort, in addition to an improved strength-to-weight ratio. Noryl is a non-conductor of heat, and is unaffected by chemicals, perspiration, or abrasion.

You'll have command of the time with a large, high-visability dial—excellent even for twilight or darkness readings. The built-in calendar automatically keeps track of the date. The quick-change feature makes it easy to set the date, as you shift through the numbers in rapid sequence.

The Swiss Mechanical Movement was chosen for its consistent reliability. There are no batteries to wear out or fail. An oversized winding stem allows for easy operation, even with driving gloves. The heavy-duty unbreakable mainspring ensures you will receive years of rugged use.

Your investment is protected by the E.S.T. 12 month parts and labor warranty. Economic Swiss Time provides a full service-by-mail facility right here in the U.S. Service should never be needed, but it's nice to know it's as close as your mailbox.

Order your Swiss Racer today without obligation. Give it a complete test run. If it's not what you expected, return it within 2 weeks. You're guaranteed a full and courteous refund. That's The Sharper Image satisfaction guarantee.

ORDER NOW TOLL-FREE

Credit card holders will get fastest delivery by calling the toll-free number below. Or send check for $29.50 plus $1.50 delivery (add $1.77 sales tax in CA). But order now as supply is limited.

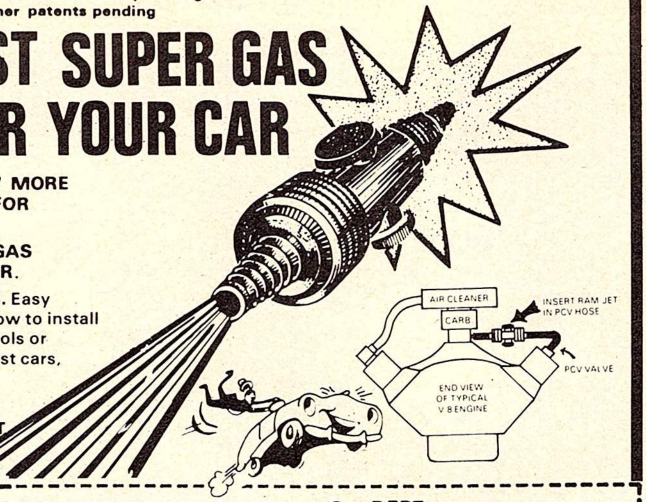
Ask for Operator 25M
(800) 824-5136
In California (800) 852-7631

THE SHARPER IMAGE

260 California Street
San Francisco, California 94111

The U.S. Government Awards the Ram-Jet Supercharger Patent No. 3118435. And other patents pending

AN HONEST SUPER GAS SAVER FOR YOUR CAR


AIR CLEANER
CARB
INSERT RAM JET IN PCV HOSE
PCV VALVE
END VIEW OF TYPICAL V 8 ENGINE

- ADD BETWEEN 1 TO 7 MORE MILES PER GALLON FOR YOUR CAR.
- AN HONEST SUPER GAS SAVER FOR YOUR CAR.
- SIMPLE INSTRUCTIONS. Easy instructions show you how to install in minutes. No special tools or training needed. Fits most cars, vans and trucks.
- FREE! ABSTRACTS OF RAM-JET TEST REPORT and other technical information.

CONSUMERS CO-OPERATIVE SERVICE, INC. DEPT D-CYCLE
1004 S. MICHIGAN AVENUE CHICAGO, ILLINOIS 60605

Please rush me the patented RAM-JET Supercharger that will give me more miles per gallon of gas.

I understand that if after 90 days I do not see a definite improvement in my gas mileage and better engine performance, I may return the RAM-JET for a replacement or a full refund.

☐ 1 RAM-JET $14.95 ☐ 2 RAM-JET $25.95 ☐ 3 RAM JET $37.95 ☐ 4 RAM JET $49.95

Add 75¢ for handling and postage

Truck or Car (year & model) 1 ______ 2 ______
3 ______ 4 ______

Name ______

Address ______

City ______ State ______ Zip ______

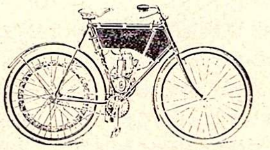
☐ Information about Ram-Jet Dealership Program

Illinois Residents Add 5% Sales Tax

THE OLDEST AND LARGEST EXCLUSIVE MOTORCYCLE MECHANICS SCHOOL IN THE U.S.A.

LEARN MOTORCYCLE MECHANICS

AMERICAN MOTORCYCLE MECHANICS SCHOOL
Chicago Campus 2840 North Halsted Street Chicago, Illinois 60657 312-929-0771
Florida Campus 13700 N.W. 19th Ave., Bay 14 Miami, Florida 33054 305-685-6466



For information on learning motorcycle mechanics fill out and return today

☐ I am a veteran.

Name ______ Age ______ Telephone ______

Address ______

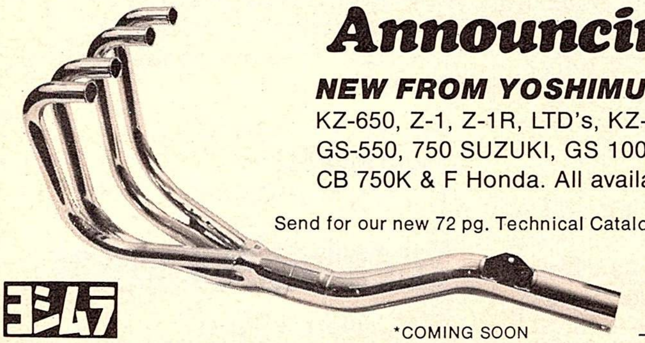
City ______ State ______ Zip ______

Announcing!

NEW FROM YOSHIMURA R&D

KZ-650, Z-1, Z-1R, LTD's, KZ-1000 KAWASAKI
GS-550, 750 SUZUKI, GS 1000 SUZUKI*
CB 750K & F Honda. All available in Bk. or Chr.

Send for our new 72 pg. Technical Catalog/Manual $3.00 ea.



*COMING SOON

YOSHIMURA

YOSHIMURA
5517 Cleon Ave.
N. Hollywood, CA. 91601

YOSHIMURA EAST
264 Marshall Hill Rd.
Dept. C
W. Milford, N. J. 07480

Continued from page 8

bike again. If people understood how an Italian bike makes straight lines out of corners, then I would wager that Japanese bikes would have a lot less chrome and horsepower and would have better brakes and frames than at present.

David M. Aall
Englewood, Ohio

EXHAUSTED OPPOSITION

Okay. I'll write the E.P.A. Motorcycle Noise office. But I wonder if our writing effort might be more beneficially directed to our elected representatives. Sometimes I think the hearing and opinion-collecting process is designed to exhaust the opposition in a useless effort to sway a bureaucracy that has no intention of being swayed.

John Hermann
Coronado, California

I read, with disbelief, the new noise regulations on motorcycles the E.P.A. has proposed in your editorial in the June issue of *Cycle.* I couldn't agree with you more, Mr. Neilson. Triumph or Ducati may not account for a large amount of the U.S. market, but they, as do Benelli, Laverda, etc., add a great deal of class to motorcycling that is greatly needed. As you advised, I have written to Washington complaining, as I should. But I have to know before I go out of my mind: did it do any good?

Roy Shiro
Idabel, Oklahoma

It's too early to tell.—Ed

CX500

I have just finished reading your super article on the Honda CX500, in the May issue. I must say, that as an owner of a CX500, I agreed with everything you said.

However, you questioned about the radiator hot-air blowback in summer driving. Living in Hawaii, we have 12 months of summer and I find that the blowback problem is not a problem at all. The only time that I noticed it was when I drove my CX wearing only a pair of Adidas with no socks, and shorts. It did get a little hot around the ankles. But this was corrected by either wearing long pants as opposed to shorts, or adding a heavy pair of gym socks. I can feel it to a point on cooler nights, but it's a comfort, not a bother. It would seem as if once the air temp reaches about 70 or 75 degrees, you don't notice the blowback anymore. Believe me, there is no discomfort whatsoever. Whether I'm riding over one of our mountain ranges during a 65-degree night, or stuck in a traffic jam during a 90-degree noontime, it's just pure pleasure.

John F. Dowling II
Kailua, Hawaii

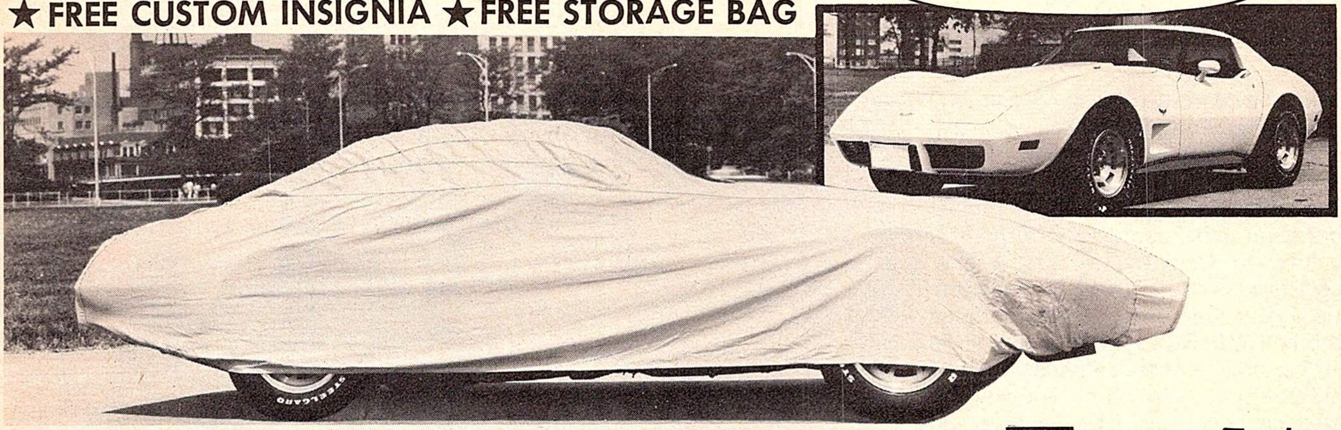
Address all correspondence to Cook Neilson, "LETTERS," CYCLE Magazine, 780-A Lakefield Rd, Westlake Village, CA 91361

At Last! A Custom-Tailored
CAR COVER for EVERY CAR!

With Exclusive *Enduralite*™ Fabric . . .

★ LIGHTER ★ STRONGER ★ LONGER LASTING
★ FREE CUSTOM INSIGNIA ★ FREE STORAGE BAG

LOW AS 39^95



Exclusive *Enduralite*™ fabric combines the best features of cotton *and* polyester for superior strength, durability *and* lightness. Stands up to constant use, wind, lasts longer. More resistant to sun-fade than all-cotton fabrics. It's water-repellent, yet fabric "breathes" to prevent moisture condensation under the cover. Mildew resistant, too.

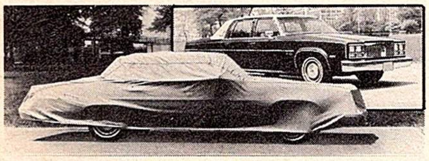
So lightweight, even a child can handle it! Average cover weighs only 8 lbs. Lightweight and custom fit make fast, singlehanded installation and removal easy for anyone. Allows easier, more compact storage. Easier to launder, too.

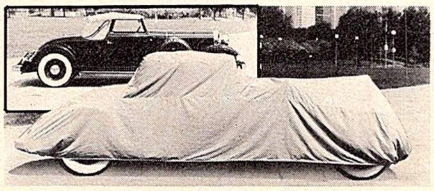
Soft, gentle fabric won't scratch your car's finish. Safe for even the most delicate lacquer finishes. *Quality construction:* Superior fabric and workmanship assure shape retention over long use. Double-sewn seams for extra strength. Elastic sewn in to front and back for a snug, perfect fit. Cover stores compactly in its own storage bag, when not in use. **Launder it at home!** Light weight and compactness let you wash and dry your cover in your home laundry . . . and water repellency won't wash out! Fade-proof. Resists wrinkles, too.

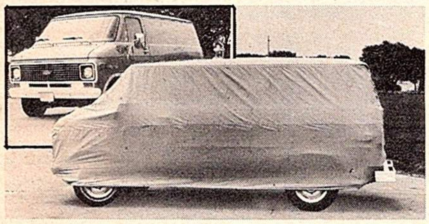
Custom covers are tailored to fit the *exact* dimensions of your particular make, year and body style. These are *not* universal-type covers with only 2 or 3 available sizes. We have 7600 patterns—including the pattern for your vehicle, no matter how new, old or rare . . . and your cover is cut and tailored from your specific, custom pattern.

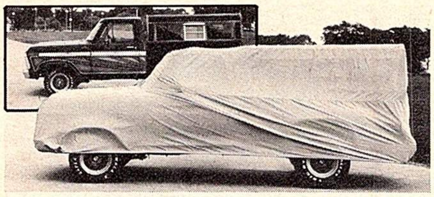
American made—not imported. *Enduralite*™ car covers are custom tailored in our United States plant where we have full control over quality and fit.

Protects your car's paint, vinyl top, metal trim, rubber and interior trim from the fade, oxidation and damage caused by the sun's harmful ultra-violet rays, by smog, industrial pollutants and ozone, by wind-blown dust and sand, by rain, snow, sleet and ice, by tree sap and bird droppings. And it helps discourage vandalism.









FOR ANY CAR LISTED BELOW

Alfa Spyder
Austin Healey Sprite
Datsun 1600-2000 Convertible
Fiat 850, 124 Spyder, 500, 1100, 1200, 1500 Convertible
Honda 600 Coupe
Lotus Elan Elite to 1971
MG, Midget, MGA, MGB-GT, MGB-MGC Convertible
Morgan 2 Seat
Triumph Spitfire, TR2, TR3, TR3A

Any car listed above. . . . . Each **$39.95**

FOR ANY CAR LISTED BELOW

Alfa-Romeo Cpe.
Arrow
Astre
Audi
Austin
Austin-Healey
Beetle
BMW
Bobcat
Capri
Celica
Chevette
Cobra
Colt
Corolla
Corona
Cortina
Corvair
Cricket
Crosley
Diamler
Datsun 240Z
Datsun 260Z
Datsun 280Z
Datsun 1200
Datsun B210
Datsun F10
DKW
English Ford
Fairmont
Falcon
Fiat exc. 850, 124 Spyder, 500, 1100, 1200, 1500 Convertible
Fiesta
Fox
Gremlin
Hillman-Minx
Horizon
Isetta
Jensen
Karmann Ghia
Lotus exc. Elan Elite to 1971
Mazda
Morris-Minor
Mustang
Mustang II
Omni
Opel
Pacer
Pinto
Porsche
Rabbit
Renault
Saab
Scirocco
Simca
Skyhawk
Starfire
Subaru
Sunbeam
Sunbird
Tiger
Triumph exc. Spitfire, TR2, TR3, TR3A
Vauxhall
Vega
Volkswagen
Zephyr

Any car listed above. . . . . Each **$48.75**

FOR ANY CAR LISTED BELOW

Accord
Alfa-Romeo Sdn.
American Motors
Apollo
Aspen
Aston Martin
Auburn
Audi
Avanti
Bentley
Bricklin
Buick
Cadillac
Camaro
Checker
Chevelle
Chevrolet
Chrysler
Citroen
Civic
Cord
Cordoba
Corvette
Cougar
Crown
Cutlass
Dasher
Datsun 260Z 2+2
Datsun 280Z 2+2
Datsun 810
Datsun 200SX
DeSoto
Dodge
Dusenberg
El Camino
Essex
Excalibur
Fairlane
Ferrari
Firebird
Ford
Frazier
Granada
Henry J.
Hudson
Hupmobile
Jaguar
Jensen Interceptor
Jeep®
Kaiser
Lam Borghini
Lancia
Landcruiser
La Salle
Le Baron
Lincoln
Mangusta
Maserati
Maverick
Mercedes-Benz
Mercury
Model A
Model T
Monarch
Monte Carlo
Nash
Oldsmobile
Omega
Packard
Pantera
Peugeot
Pierce-Arrow
Plymouth
Pontiac
Rambler
Ranchero
Rolls Royce
Rover
Seville
Skylark
Studebaker
Tempest
Thing
Thunderbird
Torino
Toronado
Versailles
Volare

Any car listed above. . . . . Each **$59.95**

FOR ANY OTHER AMERICAN OR IMPORTED CAR. . . . . Each **$59.95**

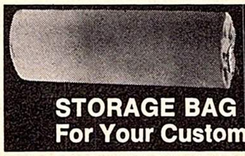
ANY PICKUP TRUCK OR VAN (1 TON OR LESS). . . . . Each **$69.95**

J.C. WHITNEY & CO., Dept. 1900-24 So. State St., P.O. Box 8410, Chicago, IL 60680

Chevrolet AMC PORSCHE Plymouth Dodge TOYOTA Ford

FREE! Custom Insignia

Your car's own custom insignia included with your car cover.



FREE
During this Introductory offer

STORAGE BAG
For Your Custom Car Cover

Cloth bag matches car cover, has draw-string closure for neat, compact, protected storage of your car cover when it's not in use. *Yours FREE* with your custom car cover, during this introductory offer.

LIMITED 2-YEAR WARRANTY

Your Custom Car Cover is warranted for 2 full years against tearing, fraying or losing it's shape or water repellency. Warranty does not include vandalism and is limited to the purchase price of the car cover.

ORDER BY PHONE—TOLL FREE

and charge your order on your Visa/BankAmericard or Master Charge.

Call 800-621-8318
24 HOURS A DAY — 7 DAYS A WEEK
Illinois residents call: 800-972-8308

MAIL TO:

J.C. WHITNEY & CO., Dept. LANG
1900-24 So. State St.—P.O. Box 8410
Chicago, IL 60680

Make my Custom-Fit Car Cover for the following car, truck or van and rush it to the address below. Include Custom Emblem and FREE Storage Bag.

Make____________________________

Year__________ **Model**____________________

Body Style__________________________

☐ **Check if your vehicle has an external antenna.**
(Use additional sheet of paper if you are ordering Car Covers for more than one vehicle).

______ **Car Covers @** ______________ **(Add $3.50 per cover for postage and handling).**

☐ **I enclose $**_______________

☐ **Charge my order to my Visa/BankAmericard or Master Charge.**

Acct. No.__________________________

Expiration Date_______________________

Copy number above your name on Master Charge Card________________

Name____________________________

Address__________________________

City____________________________

State__________________ **Zip**__________

The Duct Tapes

Yorkshire Pudding With Bone Splinters

● ON JUNE 11TH, BERNIE SCHREIBER WON the Observed Trials World Championship Series' seventh round, which was the only round in the 12-event series held in the United States. With his win, Schreiber went down in the record books as the first American to put his name on the Wagner Cup. Previous winners have included Britishers Alan Lampkin (1974), Malcolm Rathmell (1975) and Martin Lampkin (1976), and Frenchman Charles Coutard (1977). Moreover, Schreiber's win followed his victories in the Spanish and French Championship events, held on March 5th and 12th respectively.

Most of the 19 observed sections on the eight-mile course were on the rocky bed of the Cascade Run, a mountain stream tumbling over hundreds of waterfalls as it drops through Roaring Branch Motorsport Park deep in the Pennsylvania mountains. There is no terrain like this in the local New Jersey woods, which is why the only New Jersey rider entered proved to be a displaced Greek who spoke no English. But he wasn't the only one short of that ability: there were Englishmen present who only mumbled a dialect called Yorkshire, which is the King's English spoken with a mouthful of scalding Yorkshire pudding with bone-splinters.

The stream appeared impassable, and most riders walked each section three or four times before attempting it. Most of the stream bed was as slippery as shucked clams on a hot day, but the rocks under the swift water were scoured bare of moss and pitted rough, providing traction enough for World Championship class trials riders.

While walking up the creek to examine the course, some of the riders developed an unusual method of operation. They checked out the real estate on one walk past and scouted out the Playmate material on the next. Some cleverly managed to position themselves to watch the progress of a fellow competitor until the view was conveniently blocked by a potential Miss October.

During the course of the Championship event, a flaw in the rules became apparent: there is no handicap system based on inseam length. A rider such as Rathmell can telescope his leg out and pin it near the center of a section and get a tremendous amount of mileage from a single dab. He plants a foot and leaves it there long enough to take root. Now, along comes tiny Debbie Evans who has legs—nice legs—barely long enough to reach the ground. When Debbie dabs she has the motorcycle leaned over so far that the only bite she has is the raised lettering on the sidewalls.

RESULTS INTERNATIONAL CLASS

1.	Bernie Schreiber	US	Bultaco
2.	Yrjo Vesterinen	Fin	Bultaco
3.	Ulf Karlsson	Swe	Montesa
4.	Martin Lampkin	GB	Bultaco
5.	Marland Whaley	US	Montesa
6.	Curt Comer	US	Montesa
7.	Lane Leavitt	US	Bultaco
8.	Malcolm Rathmell	GB	Suzuki
9.	Mick Andrews	GB	Ossa
10.	Charles Coutard	Fr	SWM

RESULTS NATIONAL CLASS

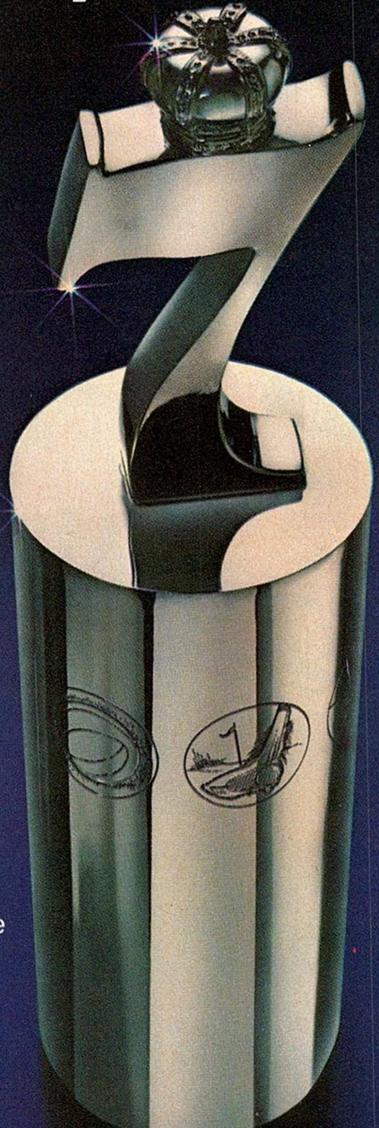
1.	Bernie Schreiber	Calif	Bultaco
2.	Marland Whaley	Calif	Montesa
3.	Curt Comer	Tenn	Montesa
4.	Lane Leavitt	Calif	Bultaco
5.	Terry Cheney	Mich	Bultaco
6.	Bob Hopkins	Mich	Bultaco
7.	Don Sweet	NY	Montesa
8.	Martin Belaire	Calif	Montesa
9.	Jack Stites	Tenn	Montesa
10.	Morgan Kavanaugh	Colo	Montesa

The sections that separated the men from the boys were the steep hillside assaults farther up the mountain. The locals called them knolls, but they were mountains by anyone else's definition. The Europeans complained bitterly about the sheer length of the things, in the neighborhood of four hundred yards apiece, and they claimed that each should be split into three separate sections. It was noted that the complainers dabbed like grape crushers and proved that you can find more traction when you're not upset.

The Pennsylvania Trials Riders hosted the World Series event with unusually warming hospitality: they held an intimate rider reception Saturday night and personally introduced each of the 119 contestants on Sunday morning. Proceeds went to the Multiple Sclerosis Society; the joy of a well-run Championship Series event went to the world. ◉

Seagram's 7 Crown

Announces the Seven Crowns of Sports Award.



The pros have to work harder, scramble more and make fewer mistakes to win them than any other trophies in sports.

This annual award isn't based on a popularity contest. It's a precise evaluation of all that an athlete's got to give, in each of the 7 major professional spectator sports—football, baseball, basketball, hockey, golf, tennis and horse racing.

Everything counts, so we count everything.

Seagram's 7 commissioned the most sophisticated computer program ever developed for weighting and measuring every aspect of competition. So we get a numerical evaluation of how close to professional perfection an athlete's performance really is.

At stake: trophies, $110,000 in awards... and a lot more.

It's called professional pride.

In fact, to the men and women who win in their particular sport, the satisfaction in outperforming everyone else may be the most important thing.

Because competition is the name of the game in any sport.

Send for the Seagram's 7 Crown Sports Calendar.

Our colorful 16-month, September 1978 to December 1979, calendar gives you a lot more than the day of the month. It includes all the year's major sports events... trivia questions... and great milestones in sports history.

...Plus dramatic illustrations depicting the origins of the sports featured in our 7 Crowns of Sports Awards.

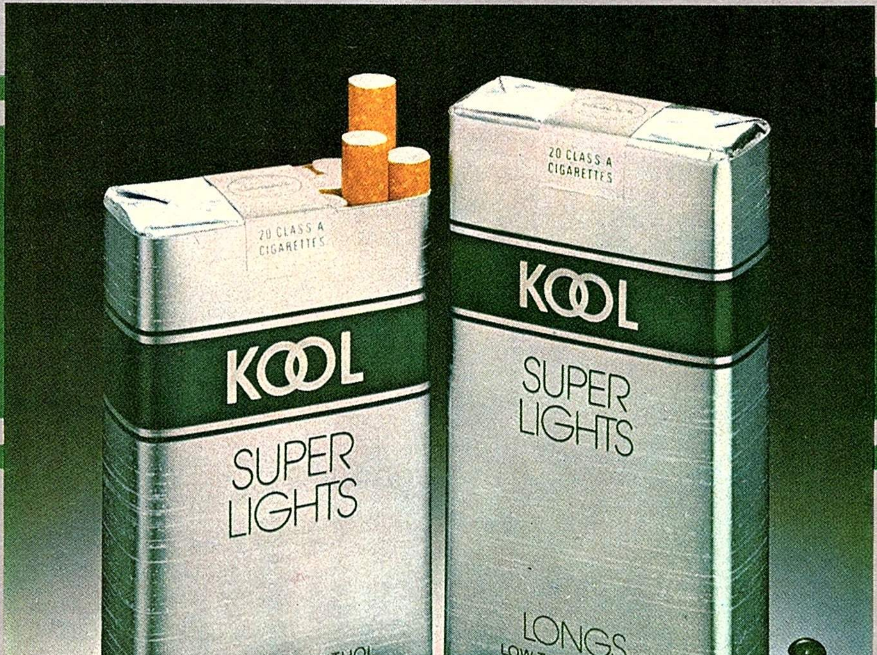
It makes a thoughtful gift, too. Order today. Only $2.95 each.

SEAGRAM DISTILLERS CO., N.Y.C. AMERICAN WHISKEY—A BLEND. 80 PROOF.

Visit your favorite store or tavern to pick up a coupon for this exciting offer or send $2.95 to Seagram's 7 Crown Sports Calendar, P.O. Box 5062, Smithtown, N.Y. 11787. Allow 4 to 6 weeks for delivery. Offer expires Oct. 31, 1978. Void where prohibited by law.

Feel refreshing coolness in a low 'tar' cigarette.

KOOL SUPER LIGHTS



Discover the low "tar" that's never dull. It's the one with the special kind of coolness that could only come from KOOL. Refreshing satisfaction you've never had in a low "tar" before.

America's most refreshing low 'tar' cigarette.

9 mg. "tar",
0 .8 mg. nicotine av.
per cigarette by FTC method.
mg. 'tar'
in both sizes.
Warning: The Surgeon General Has Determined
That Cigarette Smoking Is Dangerous to Your Health.

©1978 B&W T Co.

Pipeline

Punishment Without Crime

● THE TROUBLE BEGAN RIGHT AFTER THE sidecar race at the Italian Grand Prix at Mugello. Second-place winner Werner Scharzel refused to join in winner Rolf Biland's champagne celebrations. And a number of crews threatened to withdraw from future grands prix if Biland entered. Clearly suspicion and spite had taken root in the serene world of sidecar racing.

Biland had committed no act proscribed by sidecar convention. Nor had he stolen victory by employing questionable tactics, like dispatching the opposition headlong into the Italian trackside dirt, or wandering from the lawful path defined by the Federation Internationale Motocycliste. Yet according to his critics, Biland had sinned by contravening the spirit of FIM sidecar-construction rules while remaining legally within the letter of those regulations. By interpreting the law to permit construction of what seemed to be the ultimate exotic three-wheel rig, Biland was adjudged to have played foul.

In the past, constructors had stretched both their technical talents and the FIM rules to produce advanced outfits, without first attempting to determine the point where progress would halt. The cutoff point was undefined, precisely because nobody knew where it could or should be.

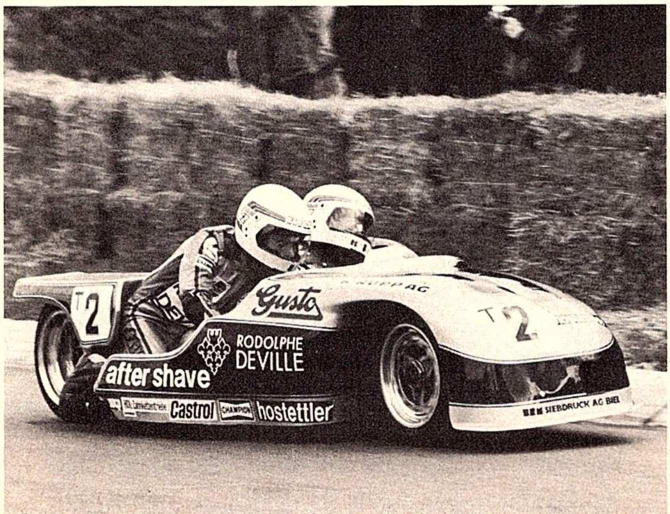
FIM authors of the sidecar specification (Motorcycles: Categories B1 & B2) are inclined to leave potential builders largely free from depressing technical restrictions. The sidehack racing motorcycle—to strain an allegory—is primarily defined as a two-track vehicle, with two wheels forming one track and the third wheel the other although 75mm offset is allowed on the main track. This divergence from the straight and true improves cornering ability to the left or the right depending upon to which side of center the third is attached. A slight left-hand offset to the front wheel assists a left-side chair through right turns; the opposite applies for the reverse configuration.

In the main the rules governing sidecars are dimensional. For instance, ground clearance must exceed 75mm and the width fall between 750mm and 1200mm, measured through the tracks. Wheelbase may be anything from 1200mm to 1650mm, but overall length and breadth cannot grow very much because body overhang is limited to 150mm at the sidecar wheel, 450mm on the bike side, and 450mm fore and aft from the centers of the front and rear axles. There are minimum dimensions for the sidecar to give the crewman a modicum of protection, and handlebars must clear the bodywork so that the operator's knuckles stay safely out of contact. Otherwise, the FIM doesn't much care how you arrange the major components within the dimensional tolerances. The third wheel may be placed anywhere along its longitudinal track and even made steerable. Engine positioning is normally governed by a motorcycle-type transmission to the rear wheel; but since two-wheel drive is legal, the powerplant can end up anywhere within the chassis.

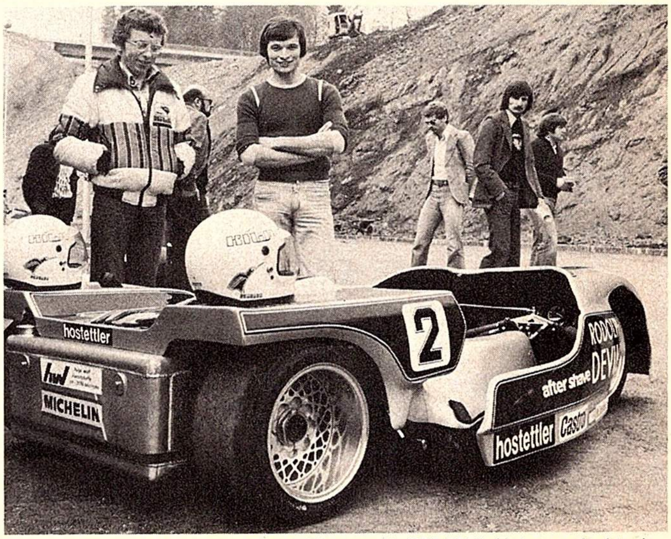
The FIM rule structure guarantees that racing three-wheelers will have some connection with the genuine street bikes with bolted-on, passenger-carrying sidecars. Indeed, you could roll along to an FIM meeting with a bolted-together device, provided that you're prepared to conduct your sidecar racing campaign with a weapon as archaic as a stone-age axe. Track triple-wheelers are only vaguely bikes-and-sidecars these days because construction is integral, and design progress has turned them into squat devices carrying small-diameter wheels and fat tires. Furthermore, the search for higher speeds and improved roadholding characteristics has endowed racing chairs with both automobile and bike features. If race car design is an exact science, then building things with one wheel missing must rank as the biggest hit-and-hope job of all time—isn't the three-wheel, two-track concept idiotic? However, the things do *go;* the 500cc engines rushed 1000 pounds of machinery and crew around the Francorchamps circuit at 124 mph.

Biland's BEO-77-A was conceived by Rolf Mercier and built by Swiss car specialists Beat Schmid and Guido Sieber, who applied their four-wheel knowledge to designing a superior racing "three." Instead of the conventional layout with the third wheel leading the rear, the Beo's wheels were sited in line. In place of the usual single-wheel drive, both rear wheels received power from a Yamaha-four unit located in the "sidecar" where the passenger would normally sit. Full enclosure was carried further by mounting the transverse fuel tank between the rear wheels, leaving a hole in the bodywork for the

(Continued on page 119)



Biland kneels while Williams sits. The front wheel has hub-center steering.



Rolf Biland (arms folded) and Ken Williams with BEO-77-A. Note rear fuel tank.

Pay & Benefits
If you enlist in the Army, you'll start with good pay; a long list of skill-training courses to choose from; 30 days paid vacation each year; the opportunities to travel, to continue your education, and to qualify for veterans' educational benefits. For more information about all the opportunities in today's Army, send the postcard. Or call 800-431-1976 toll free. In NY call 800-243-5614.

"It's like the way a baby grows. It's a child, then a teenager, then a man. It all comes with responsibility. You've got to prove yourself every step of the way. That's the way the Army is. They'll give you a piece of equipment, train you, and say, 'You are responsible'. If you're good and you know your job, you'll move up and get more. Right now I'm a senior gunner in a Chaparral Missile section. And every guy on this section is responsible for the other guy. That can make you an adult quickly. Responsibility feels like—it feels like strength."

SGT Calvin Jarrell, Schwabach, Germany

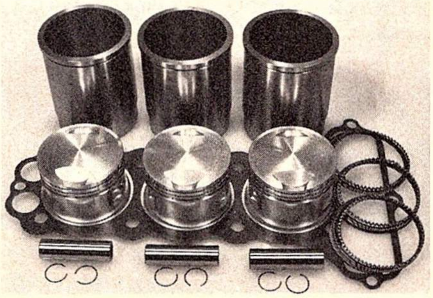
Join the people who've joined the Army.

Spender's Corner

Goggles: The folks at MXL put a lot of effort into product design; safety and comfort; creative use of materials; and continual product improvement are their stated aims. Their Uni-Racer goggle retains but one pin to keep its lenses from popping out, and for the most part, the job is accomplished by self-locking tabs molded on the goggle frame. Other MXL goggles are entirely pin-free. Choose clear, yellow, smoke or polarized replacement lenses. National Hydron, 1633 Rothsville Road, Rothsville PA 17573.

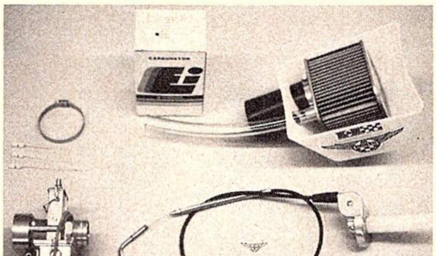
CIRCLE NO. 1 ON READER SERVICE PAGE

Power-Up: Looking for more horses for your Yamaha XS750? Consult the power pros at Powroll for their 897cc kit featuring 74.5mm pistons, rings, wrist pins, clips, head gasket and large sleeves. The order number is 00172, the price $150. If you prefer, order the Powroll 815cc Big Bore Kit with 71.0mm pistons, rings, wrist pins, clips and head gasket, retailing for $125. Its stock number is 00171. Go the direct route to Powroll Performance Products, Inc., P. O. Box 1206-JC9, Bend OR 97701.



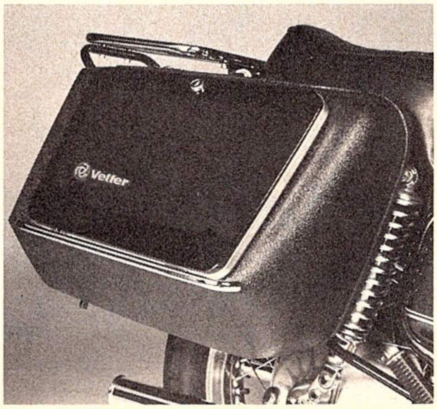
CIRCLE NO. 2 ON READER SERVICE PAGE

Carb: The EI carburetor has become available in a complete kit for use on Yamaha TT and XT500 motorcycles. Containing a 38mm carb, new air box and K&N filter, the kit is not only lighter than the stock system, according to Al Baker Racing, but also allows greater volume. A Gunnar Gasser throttle, Terry cable and all the hardware for mounting the new system accompany the major components. The manufacturer claims, furthermore, that the thumper kit provides instant throttle response, eliminates flat spots in the powerband, and improves gas mileage as much as 20 per cent. Write to Al Baker Racing and Development, P.O. Box 1492, Apple Valley CA 92307.



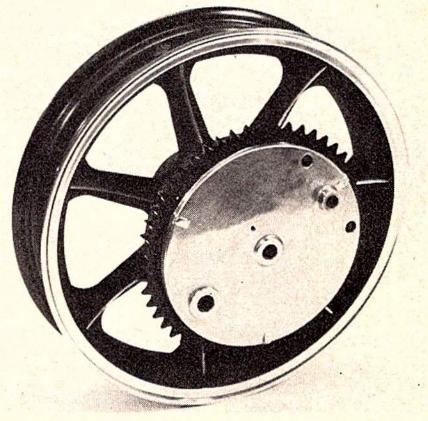
CIRCLE NO. 3 ON READER SERVICE PAGE

Luggage: The people at Vetter Fairing, who desire to lend as much comfort as possible to touring, have introduced floating-mount saddlebags which, the company reports, "give" as you ride. Designed to dampen oscillation, the mounting system (not the motorcycle) absorbs road vibration from the bags. One key opens the bags and detaches them from their mounting. You can get the bags color-matched to almost every 1978 Superbike. Vetter Fairing Company, 1150 Laurel Lane, San Luis Obispo CA 93401.



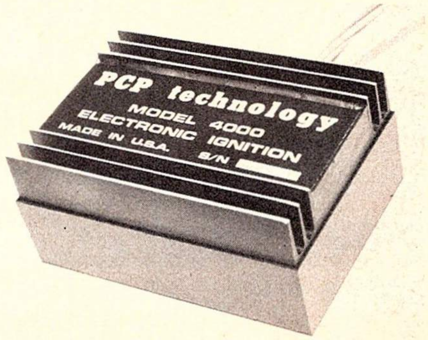
CIRCLE NO. 4 ON READER SERVICE PAGE

Wheels: The latest edition in custom motorcycle wheels comes from Morris Industries who introduce mags for Sportsters. Manufactured in 18- and 16-inch-diameter models, both versions bolt directly to the stock Harley-Davidson drum brake. The wheels are available in the standard Morris black finish you've come to know so well, with highlighted spokes. The manufacturer promises simple installation. Contact Morris Industries, 2901 West Garry Avenue, Santa Ana CA 92704.



CIRCLE NO. 5 ON READER SERVICE PAGE

Fire! More than a year of research, engineering and road testing have gone into PCP Technology's high-performance inductive-discharge electronic ignition systems. Model 4000 is for all dual-coil, dual-point motorcycles and, according to the manufacturer, provides 350-degree dwell, as well as increases of 57 per cent in energy and 105 per cent in voltage at 8500 rpm. The compact unit is weatherproof and guaranteed for a full year. BMW owners should ask for model 400B. Send $135 to PCP Technology, 1729 Falkirk Drive, Madison OH 44057.



CIRCLE NO. 6 ON READER SERVICE PAGE

(Continued on page 22)

Thank goodness the best things never change.

Like the feeling you get when your team comes through. Because they gave their best performance.

Like the feeling you get with every sip of Smooth as Silk Kessler.

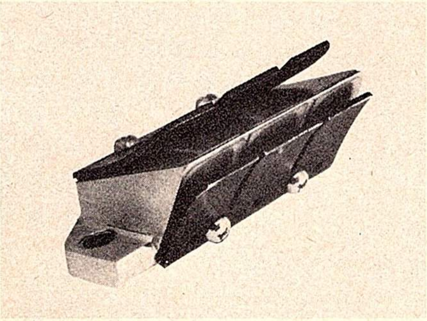
Consistent. Smooth. Sip after sip. Time after time. Money just can't buy a smoother whiskey.

SMOOTH AS SILK KESSLER

JULIUS KESSLER COMPANY, LAWRENCEBURG, INDIANA. BLENDED WHISKEY. 80 OR 86 PROOF. 72½% GRAIN NEUTRAL SPIRITS.

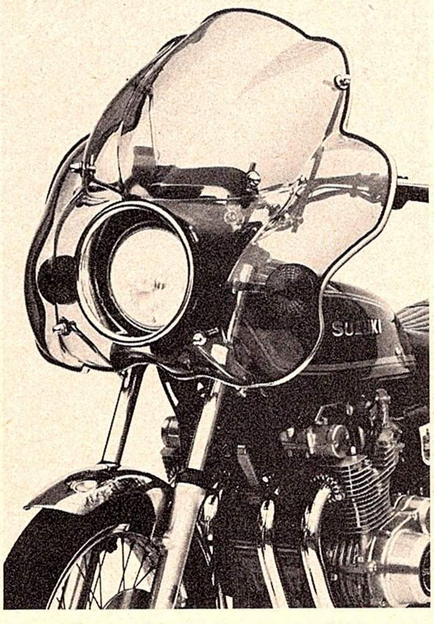
NEWSLINE .... *Continued from page 20*

Reed Power: Owners of RM Suzukis who've been longing for a "works bike" powerband will be glad to hear about the Flying Machine Factory's innovation, the TorqueReed. It comes packaged with promises from the manufacturer, among them a dramatic increase in torque range and 500 rpm more top-end advantage. You won't find it necessary to modify your cylinder. Torque Reed bolts on in little time; it comes with extra petals. It's available for 1976 through 1978 RM-100, 125, 250, 370 and 400 models; it will also fit the PE Enduro models. Flying Machine Factory, Inc., 1416 W. 259th Street, Harbor City CA 90710.



CIRCLE NO. 7 ON READER SERVICE PAGE

Fairing: European styling characterizes the Hugon GT Fairing, constructed of impact-resistant Lexan for safety and maximum visibility. Hugon engineers chose Lexan for its ability, in their experience, to retain a high-quality appearance over time; each fairing comes with a one-year guarantee. Streamlined aerodynamic design is the manufacturer's claim to the fairing's ability to enhance a motorcycle's stability, handling, comfort and performance. Chrome edge trim is optional. See your dealer, or write Hugon Fairing and Distributing, 27 Loring Road, Weston MA 02193.

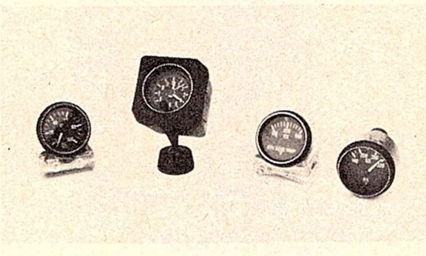


CIRCLE NO. 8 ON READER SERVICE PAGE

Leathers: Wanna design your own racing leathers? Patty Perron did, for herself at first, and now you can too, with the help of her order form: you can select everything from colors to special features. Full-grain cowhide sewn together with high-tensile nylon stitching results in a made-to-measure suit that will, Ms. Perron believes, protect you like a second skin. Her promise is that every suit of leathers she constructs benefits from her own racing experience. Perron Leathers, 2 Highland Avenue, Northfield MA 01360.

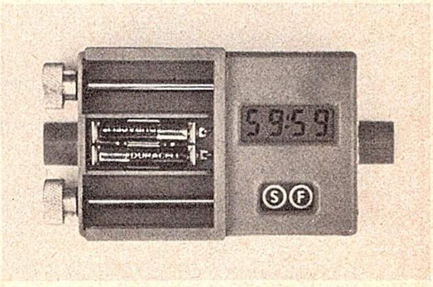
CIRCLE NO. 9 ON READER SERVICE PAGE

Gauges: Road Rider Touring Accessories offers a line of Stewart Warner gauge kits. These superbly crafted gauges will mount directly to your fairing. Among their features are steel cases, optically correct internal lighting, internal mounting systems designed to withstand excessive shock and vibration, and bi-torque stationary-coil 90-degree movements. There are kits for oil pressure; oil, cylinder head and water temperatures; clock, volt meter and hour meter, as well as mounting modules and audio-visual warning system. Kits include senders, conversion fittings and lighting components. Road Rider Touring Accessories, 2074 Westwood Blvd., Los Angeles CA 90025.



CIRCLE NO. 10 ON READER SERVICE PAGE

Timer: Countdown Engineering's Timekeeper combines two necessary features in one compact unit: an enduro clock and a roll-chart holder. Powered by two Duracell batteries, Timekeeper holds 2¼-inch roll chart paper and displays minutes and seconds in half-inch LCD numerals. The display case is sealed against water and dust. Additional features are replaceable roll-chart bushings, slide-in chart cover and universal mount with hardware. All this plus a 90-day warranty for about $90. You can obtain yours directly from the manufacturer: Countdown Engineering, 22102 Covello, Canoga Park CA 91303.



CIRCLE NO. 11 ON READER SERVICE PAGE

Pants: Nylon MX Pants from Big 4, Inc., are constructed of heavyweight nylon, thickly padded at the hips. The company's new product features zippered knee-pockets holding close-cell foam knee protectors. Furthermore, inseam and seat are given extra protection with sewn-in vinyl padding. The ankles zip, while the front zips, snaps and buckles too. Available colors are blue, red and black. Sizes range from 22 to 38. You can have a pair for about $40. Ask for more information, or order directly from Big 4 Inc., P.O. Box 3683, Spokane WA 99220.

CIRCLE NO. 12 ON READER SERVICE PAGE

© 1978 R. J. Reynolds Tobacco Co.

"Real's strong taste is dynamite. More like a high tar."

I used to smoke a high tar brand. No more. Real's got the strong taste I want. Strong enough to satisfy. Beats me how they pack all that taste in a low tar. Made a different way, I guess. More of the good, natural stuff. Miss my old high tar brand? No way.

Check out Real.

Only 9 mg tar.

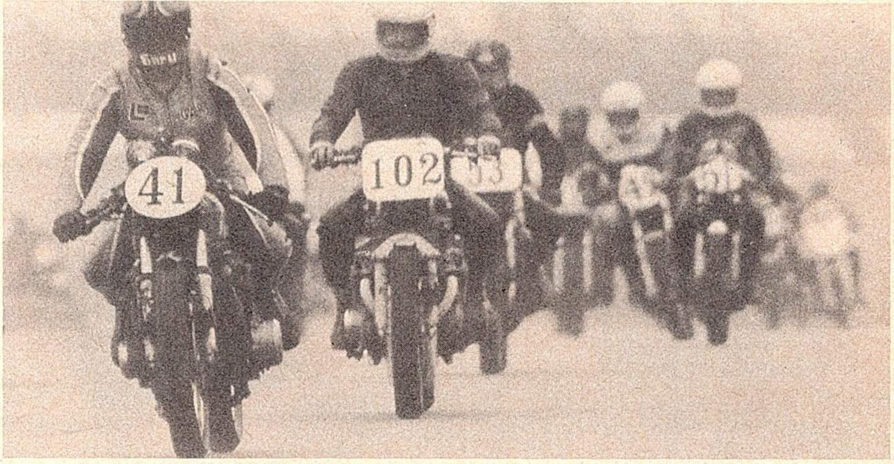
The strong tasting low tar.

Warning: The Surgeon General Has Determined That Cigarette Smoking Is Dangerous to Your Health.

MENTHOL: 8 mg. "tar", 0.6 mg. nicotine, FILTER: 9 mg. "tar", 0.7 mg. nicotine, av. per cigarette, FTC Report MAY '78.

Varoom/Splash/Varoom/Splash

PHOTOGRAPHY: PAT BEHAR



The haze in the photograph isn't fog; it's genuine, real-for-wet rain; there was five hours of it.

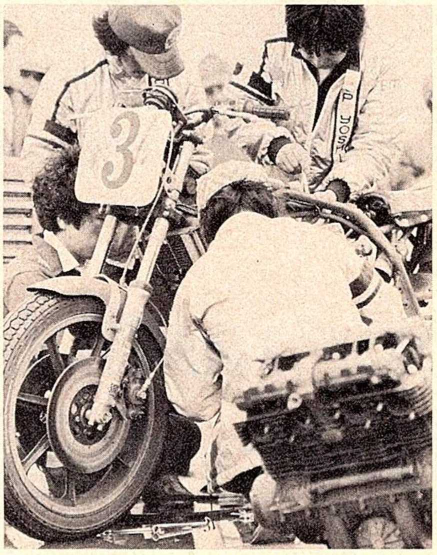
● Southern California racers rarely have to confront rain, and no SoCal sun-bunny has ever been known to stand out in the rain for five or six hours. But at this year's American Federation of Motorcyclists Six-Hour Endurance Race, 101 teams had to deal with a relatively unknown factor: wet asphalt. Held at Ontario Motor Speedway, the fourth annual AFM Endurance Race was run on April 30, at the end of the wettest season in California's record books. At 11:00 a.m. the first rain drops and starting flag fell in unison. Confounding the racers' choice of tires, the rain varied in intensity until the fifth hour.

Endurance racing has been steadily gaining popularity. The inaugural event in 1975 attracted 67 teams, 38 of which finished. In the following two years, entries grew to 72 teams, then jumped to 88 teams, and the number of finishers kept pace, rising from 36 to 48. This year 65 teams finished.

Starters and finishers are always attracted by the general laxity regarding "legal" machinery. Anyone can race virtually anything which isn't manufactured exclusively for racing. What's acceptable includes a turbocharged Suzuki 1000, an AMA Superbike and a hybrid that joins a street chassis to a TZ750 engine. There's also plenty of room for non-exotics. Small-displacement classes invite relatively low-buck—though serious—efforts, such as the Can-Am of Gordon Seim and Jeff Little, this year's 250 class winners. The popularity of the race is heightened by loose rules governing the teams: anyone from Kenny Roberts to John N. Ebody can race. The only rule regarding teams dictates that each team must have at least two human beings able to stand and take nourishment at the beginning of the race.

This informality can be a fooler. The Six Hour attracts top riders, and it's dominated by those who put forth a dedicated effort. Last year, at least one member of each of the top three finishing teams also won an AMA Superbike National.

After the first few laps riders fell into some sort of order indicative of riding talent and wet-weather traction, and the Paul Ritter/Vance Breese/Jody Nicholas Ducati led. The Wes Cooley/Gary Fisher/Ron Pierce Yoshimura Suzuki, noticeably faster on the half-mile straightaway, was close behind. But the Suzuki had slicks, and the Yoshimura team elected to make a premature pit stop, believing that swapping for treaded tires would produce more laps in the end. Meanwhile, Ritter—even though running slicks—pulled away from the field at an average of four seconds per lap.



If an engine croaks in a six-hour event, you replace the entire engine—assuming you're Yoshimura R&D.

As the race wore on, the wet asphalt continued to play tricks with the top ten riders. The Reg Pridmore/Keith Code/Pierre DesRoches machine used Code's Superbike chassis with a stock KZ1000 engine. Pridmore started on the machine, but he couldn't work up beyond seventh place on the slicks. Several RD350s, all fitted with treaded tires, played David to Pridmore's Goliath and edged past the Kawasaki.

Other teams ran into their share of trouble. Very early in the race, the Ritter Ducati, then leading, came sputtering to a halt with a damp Italian ignition. Tuner Dale Newton dried the electrics out, whereupon Ritter went out and quickly recaptured the lead. An hour-and-a-half into the race, however, with its problems seemingly behind it, the Ritter/Breese/Nicholas Ducati suddenly expired again, this time for good.

On the laps when it was raining hardest, machines with treaded tires were running only 10 to 15 seconds off their dry track times. Machines on slick tires were hindered more, running 15 to 20 seconds further down. Clearly, the longer and harder it rained, the greater the chances were for an upset victory.

Shortly into the fifth hour of the race, the rain eased and the remaining teams began more conventional—which is to say, Superbike-dominated—racing. At this point, the teams of Hurley Wilvert/Dennis David (Kaw 1000) and Rodger Hagie/Gil Martin (Kaw 650) were dicing for the lead. But Pridmore, on the Team Vetter Kawasaki, began to show how well his slicks worked on dry ground: he started picking up 10 to 15 seconds per lap on the leaders.

Five laps from the finish, Pridmore discovered his team had miscalculated the fuel supply. He could take a long shot on finishing with the gas he had or almost certainly give up his chance for the win by pitting. He decided there was no way to make it on the fuel in the tank, pitted, had the gas cap break, duct-taped the cap on and returned to track 37 seconds down. Pridmore pulled out all the stops, passed the Wilvert/David Kawasaki on the last lap and won by eight seconds. And out of the total 21,600 seconds in the rain-soaked six-hour event, those very last ticks were the most important of all.

—Keith Code

Magazines At Discount

Reg. Rate: 12 Issues/$12

Lowest Available Sub Rate 32 issues

Newsstand Rate: 25 issues/$25

Reg. Rate: 26 issues/$18

Newsstand Rate: 12 issues/$25

You SAVE up to 50%

Here's your chance for a real bargain bonanza on your favorite magazines. You may select as many as five of these titles at the special introductory rates shown — up to 50% off! To order, indicate the magazines you want by inserting their code numbers in the boxes on the attached order card. Or write to: MAGAZINES AT DISCOUNT, A Division of Ziff-Davis Publishing Co., P.O. Box 601, Broomall, Pennsylvania 19008

CHOOSE YOUR FAVORITES AT DISCOUNT PRICES!

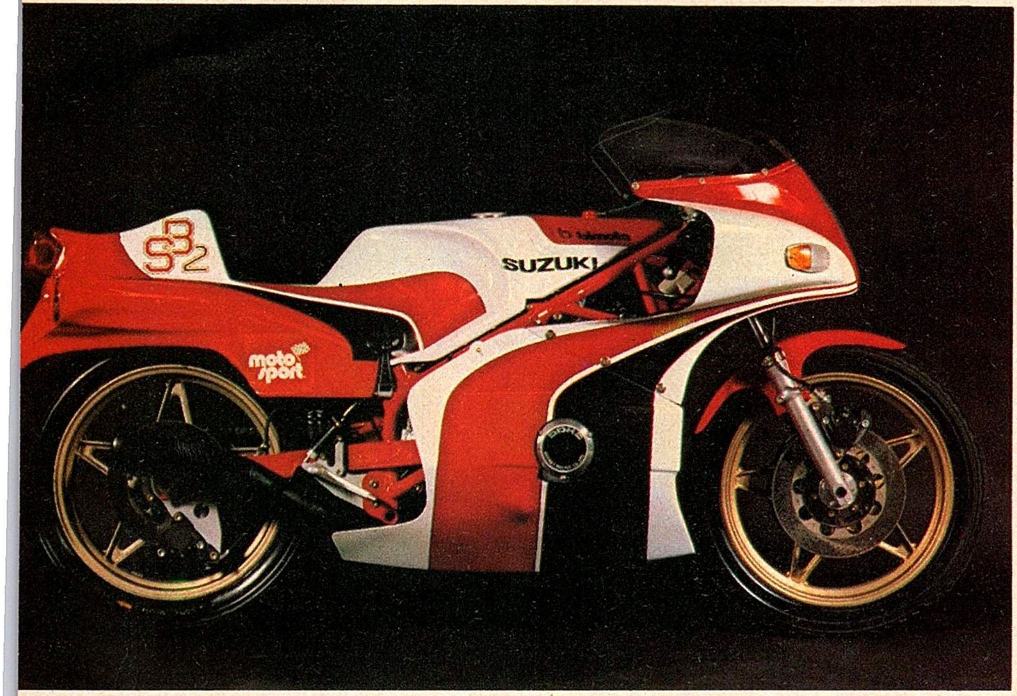
21	APARTMENT LIFE	24 ISSUES	YOU PAY ONLY $7.97	Reg. Rate: 24 iss. $14.97
43	Field & Stream	18 ISSUES	YOU PAY ONLY $5.97	Reg. Rate: 18 iss. $11.93
06	Popular Electronics	12 ISSUES	YOU PAY ONLY $8.97	Reg. Rate: 12 iss. $13
38	Sports Illustrated	26 ISSUES	PAY ONLY $12.77 Reg. Rate.	Newsst. Rate: 26 iss. $26
22	Better Homes and Gardens	12 ISSUES	YOU PAY ONLY $8	Newsst. Rate: 12 iss. $11.40
04	FLYING	12 ISSUES	YOU PAY ONLY $11.97	Reg. Rate: 12 iss. $15
07	POPULAR PHOTOGRAPHY	12 ISSUES	YOU PAY ONLY $6.99	Reg. Rate: 12 iss. $13.98
75	SPORTS AFIELD	12 ISSUES	YOU PAY ONLY $7.50	Reg. Rate: 12 iss. $15
01	Boating	12 ISSUES	YOU PAY ONLY $8.97	Reg. Rate: 12 iss. $14
71	FOUR WHEELER	12 ISSUES	YOU PAY ONLY $4.50	Reg. Rate: 12 iss. $9
08	psychology today	12 ISSUES	YOU PAY ONLY $6.97	Reg. Rate: 12 iss. $12
11	Stereo Review	12 ISSUES	YOU PAY ONLY $4.99	Reg. Rate: 12 iss. $9.98
48	Business Week	51 ISSUES	PAY ONLY $26 Reg. Rate	Newsst. Rate: 51 iss. $63.75
28	Mechanix Illustrated	18 ISSUES	YOU PAY ONLY $5.96	Reg. Rate: 18 iss. $11.90
37	REDBOOK	18 ISSUES	YOU PAY ONLY $11.93	Newsst. Rate: 18 iss. $22.50
40	TIME	25 ISSUES	YOU PAY ONLY $14.97	Newsst. Rate: 25 iss. $25
70	CAR CLASSICS	6 ISSUES	YOU PAY ONLY $4.50	Newsst. Rate: 6 iss. $9
47	Ms.	12 ISSUES	YOU PAY ONLY $5.97	Reg. Rate: 12 iss. $10
56	Rolling Stone	26 ISSUES	YOU PAY ONLY $12	Reg. Rate: 26 iss. $18
41	TV GUIDE	32 ISSUES	YOU PAY ONLY $9.53	Lowest Avail. Sub Rate
02	CAR and DRIVER	12 ISSUES	YOU PAY ONLY $4.99	Reg. Rate: 12 iss. $9.98
44	Newsweek	23 ISSUES	YOU PAY ONLY $12.99	Newsst. Rate: 23 iss. $23
88	THE RUNNER	9 ISSUES	YOU PAY ONLY $8.97	Reg. Rate: 9 iss. $13.50
99	TV GUIDE	52 ISSUES	YOU PAY ONLY $15.50	Lowest Avail. Sub Rate
03	Cycle	12 ISSUES	YOU PAY ONLY $4.99	Reg. Rate: 12 iss. $9.98
31	New Times	19 ISSUES	YOU PAY ONLY $9.50	Newsst. Rate: 19 iss. $19
85	science Digest	12 ISSUES	YOU PAY ONLY $7.97	Newsst. Rate: 12 iss. $9
86	us	15 ISSUES	YOU PAY ONLY $8.97	Lowest Avail. Sub Rate
49	ESQUIRE	18 ISSUES	YOU PAY ONLY $10	Newsst. Rate: 18 iss. $20
34	PLAYBOY	12 ISSUES	YOU PAY ONLY $14	Newsst. Rate: 12 iss. $25
09	SKIING	7 ISSUES	YOU PAY ONLY $5.99	Reg. Rate: 7 iss. $8.98
89	working Woman	12 ISSUES	YOU PAY ONLY $7.50	Newsst. Rate: 12 iss. $15

THE BIMOTA SB2

The SB2 is more than cleverly joined chrome moly steel, rampant, heaving fiberglass, zippy technical ornamentation and obsessive attention to detail. It is a ticket to a place you've never been before. This is what makes it, God help us all, worth the money.

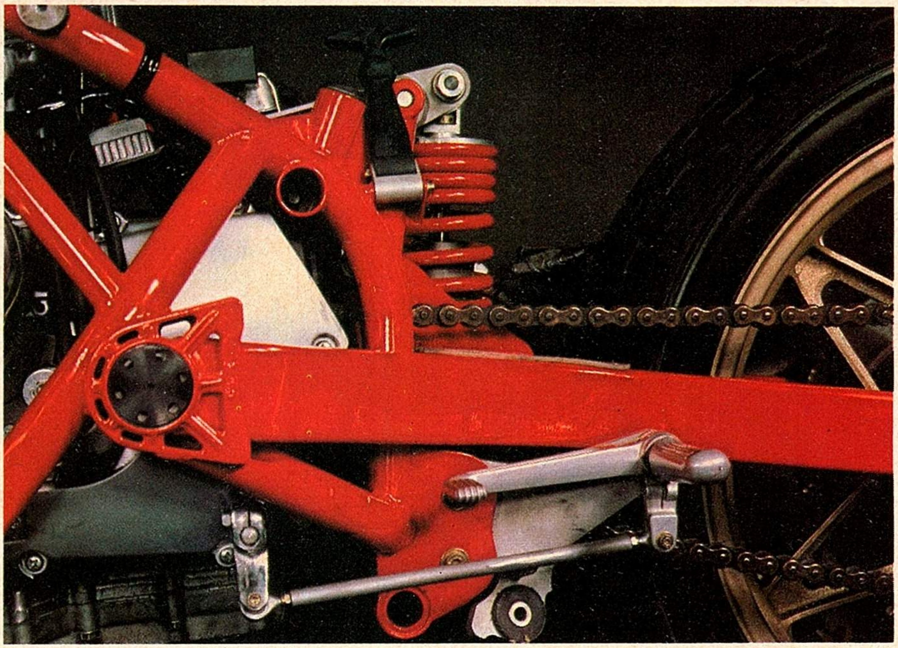
b bimota
SUZUKI
SB2

PHOTOGRAPHY: DAVE HAWKINS

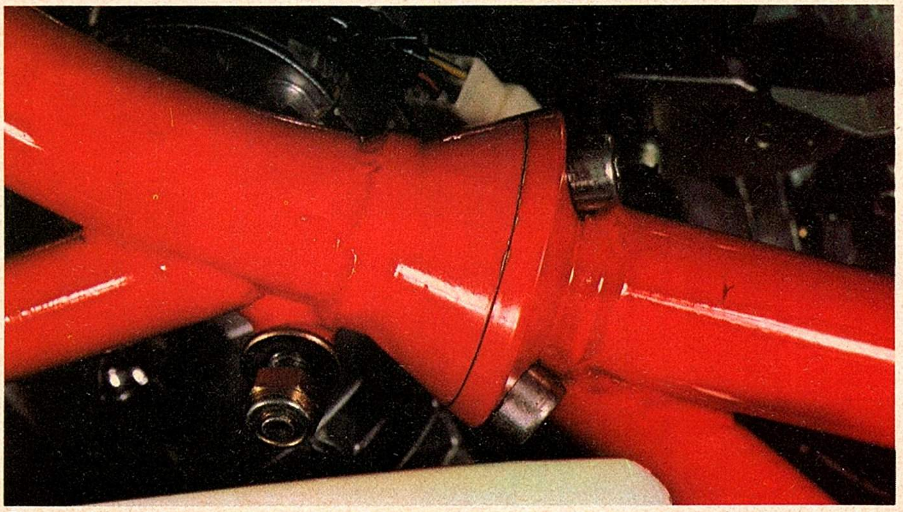


THE BIMOTA SB2

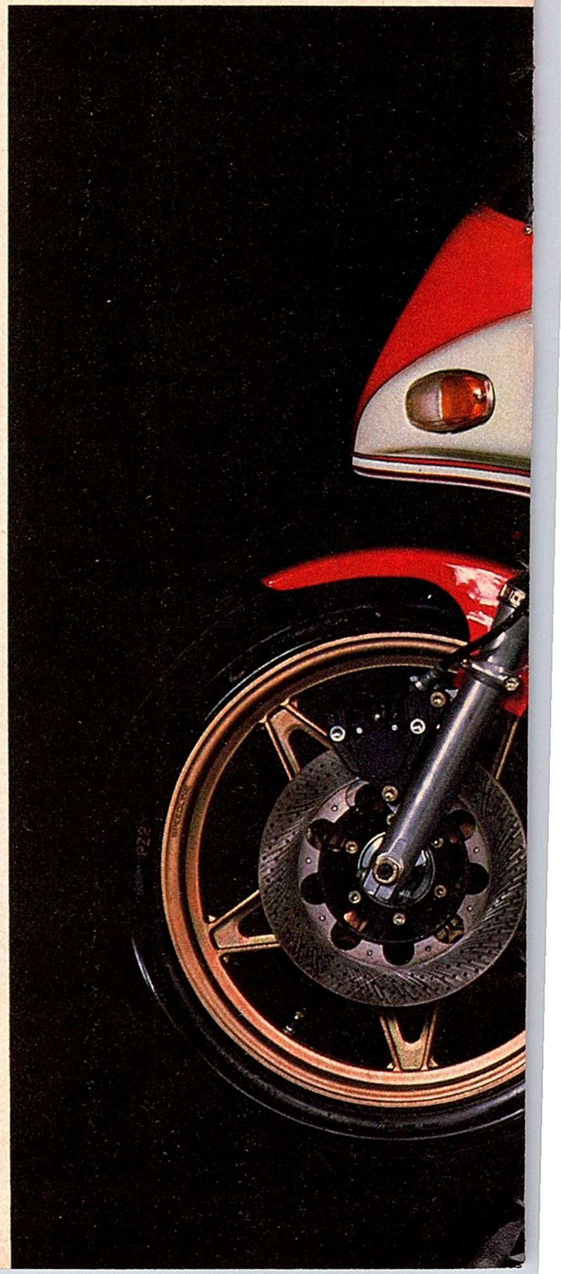
● IF YOU'RE LOOKING FOR REASONS TO BE suspicious of the Bimota Suzuki SB2 chassis kit, try these on for size: it costs $6500, and you have to supply the engine and electrics; it replaces a chassis which for all intents and puposes is an excellent one and has been so lauded; its surface has been almost mortally overswooped, with broad black and red panels edged in contrasting pinstripes diving through and across enough formed fiberglass excursions and redoubts to wring a cry for mercy from the hardest-bitten Kalifornia Kustom Kar freak pancaking down Van Nuys Boulevard of a Wednesday evening; it has clip-on handlebars, rear-set footpegs and the most uncomfortable seat this side of the rail Jennings always claims they rode him out of town on the other night; and the frame, which is really what it's all about, is painted bright Italian racing red—a suspicious color, since it invariably appears on vehicles which have never

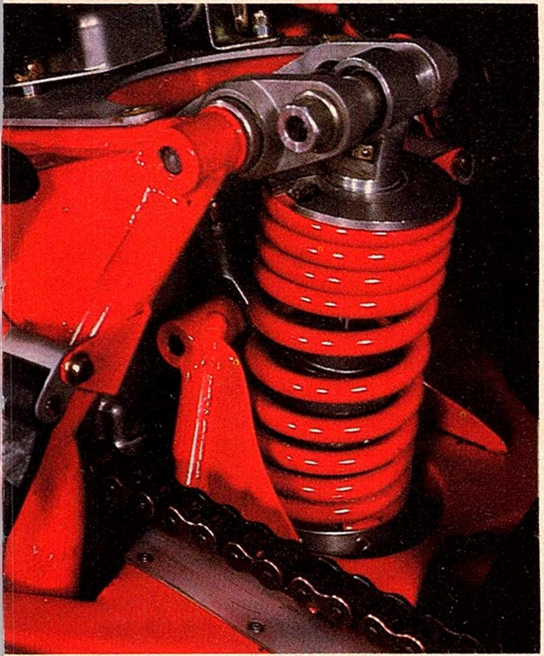


Swing arm pivots on outboard bearings located concentric to the countershaft; chain tension never varies.



Bimota's forward frame portion attaches to the rear assembly with a pair of aircraft-style conical joints.





Bottom of shock attaches directly to swing arm; the top is linked to it through an aluminum rocker arm.

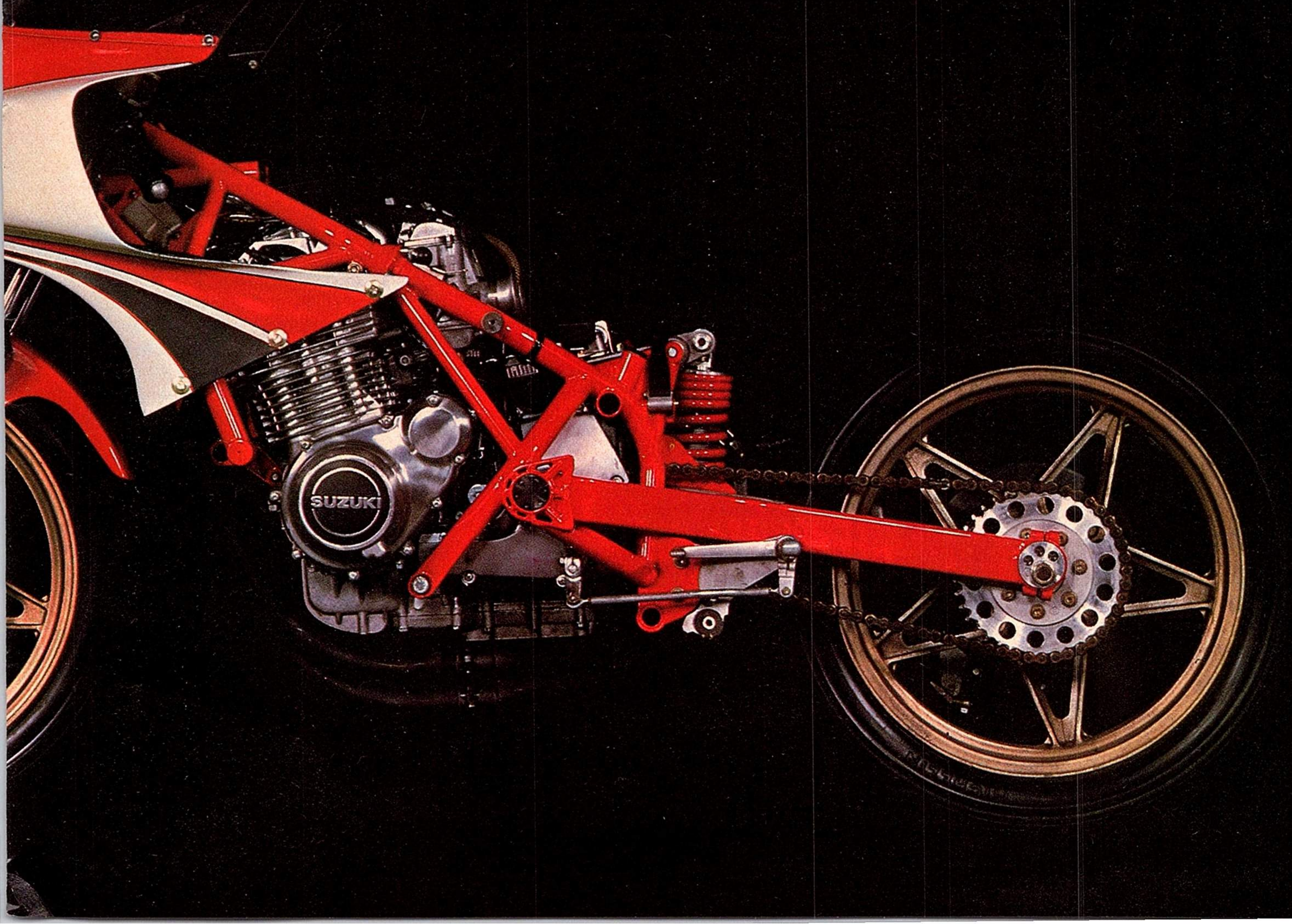
been to Italy and would fall over dead if they ever set wheel on a race track.

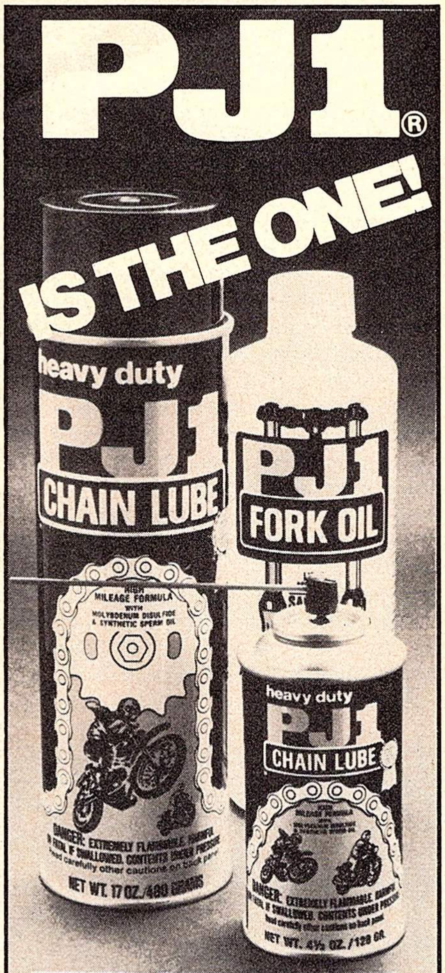
These were the precise suspicions we harbored as Paul Puleo, owner of Moto Sport Inc. and the importer of the Bimota line for all of the United States and New Jersey, rolled the SB2 off the trailer and into the *Cycle* Magazine shop. There were chuckles of derision mingling with catcalls of contempt, and this went on until we put the little Bimota on the scales. With 20 liters of gas in the tank (5.2 gallons) the SB2 weighed 472 pounds—fully 60 pounds lighter than a standard Suzuki GS750.

Hmmm, we thought. Out came the tape measure. The Bimota's wheelbase was 54.75 inches—4.25 inches shorter than the GS750's; its seat height was 1.75 inches lower, its fork assembly three inches shorter—but it carried its engine fully an inch higher off the ground than the stock GS.

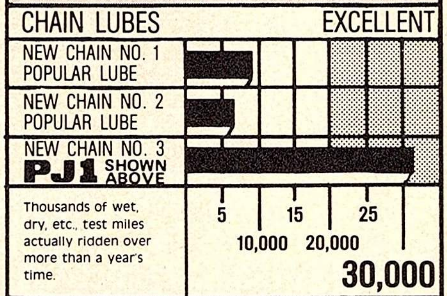
After these preliminary measurements we got down to some serious eyeballing. The SB2 is a monoshocker, with a single automotive racing shock mounted vertically in front of the rear tire. The lower end of the shock connects directly to the swing arm, but the upper end attaches to the chassis with a centrally supported rocker arm. One end of the rocker locates the top of the shock while the other end connects to the front of the swing arm with a double-Heim-jointed link rod. The bike's rear wheel travel of 5.5 inches is almost matched by the front wheel's 4.5-inch travel dimension; likewise the rear suspension's trickery is almost matched by geometry jiggery-pokery at the front. On the Bimota, the steering head axis is 24 degrees from the vertical, while the fork pipes are carried at 28 degrees. Bimota gives as a reason for this, reduced trail change under severe braking. Also, the trail dimension can be adjusted to one of two settings—3.9 or 4.7 inches—by rotating eccentrics, secured by set screws, held in the triple clamps.

But the most beguiling aspect of the Bimota SB2 is its swing arm. Long (24 inches, almost half the wheelbase of the complete motorcycle), strong (box-sec-





TRIPLED CHAIN MILEAGE
TO OVER 30,000 MILES
UNDER ACTUAL RIDING CONDITIONS



"PJ1 . . . is better than anything else I've ever tried."
Bob Anderson, Road Rider Magazine.

TREATS RUBBER O-RINGS
Heavy Duty PJ1 Chain Lube has been tested and used extensively on chains equipped with rubber o-rings and self-lubed chains. It has been proven to dramatically increase the mileage of such chains.

T-SHIRT OFFER
Send $3.95 for T-Shirt and/or Hat.
Indicate T-Shirt size:
sm. _____ med. _____
lg. _____ xlg. _____

PJ1 CORPORATION

PJ1 CORPORATION
5955 DESOTO AVENUE
WOODLAND HILLS, CA 91367

CIRCLE NO. 93 ON READER SERVICE PAGE.

BIMOTA SB2 .... *Continued from page 31*

tion steel, 1.1 x 2.1 inches) and beautifully gusseted, the swing arm pivots on tapered roller bearings supported on each side by three outrigger frame members. These bearings are concentric with the transmission countershaft; the result is that the final drive chain can operate at constant tension, which not only makes life easier for the chain but isolates the chassis from any influences the chain may ordinarily have on it.

By now we were becoming properly respectful. Most contrivances like this look better the farther away they are. The Bimota rewards close scrutiny, and the closer the better. Two examples: the chassis embraces the 750 Suzuki so tightly that there is no room for the four chrome-plated covers attached to the ends of the cam cover, and Bimota supplies a blueprint which highlights this detail; and instead of manufacturing, or having Brembo supply, a front brake line splitter to connect the single master cylinder to the two brake calipers, Bimota uses a special boss cast integrally with the lower triple clamp, thus saving weight, complication and expense. Triple clamps and footrest supports are milled from solid billets of aluminum; the footrests and foot control levers are forgings; and the WM3 and WM6 wheels—Italian "Speedline"—are genuine magnesium.

Once you get beyond the bodywork's attempt to reproduce a Calder design for a Boeing 707, you notice one of the most surprising aspects of the Bimota: the quality of its fiberglass. Strong, clean and symmetrical, the glass work is a match for anything we've seen anywhere—and infinitely superior to the scabby, warped and tormented fiberglass that normally comes from Italy.

Bimota is a small (20-man) organization in Rimini owned and directed by Massimo Tamburini and Giuseppe Morri, who started the company essentially as a hobby six years ago. Walter Villa and Franco Uncini at one time used Bimota chassis on their GP Harley-Davidsons, and Johnny Cecotto's world championship-winning Yamaha 350 (1975) was also Bimota-equipped.

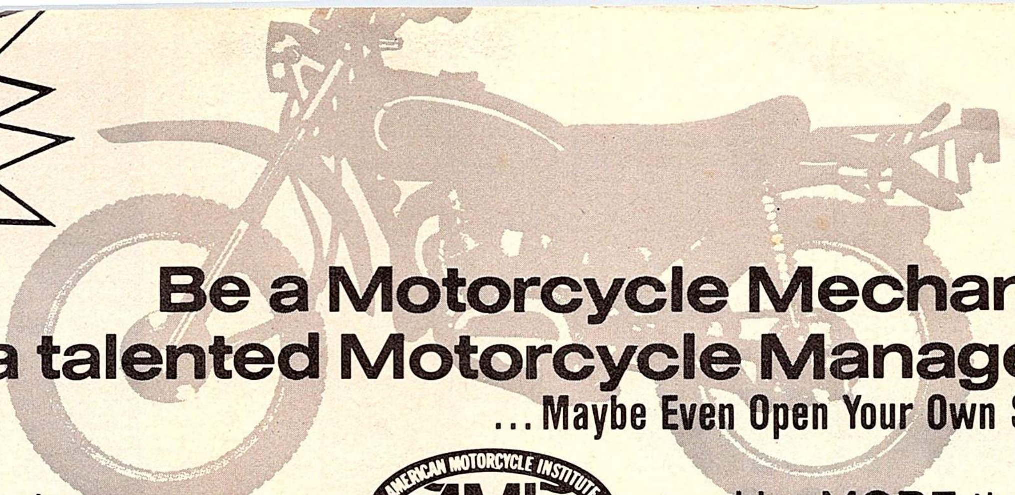
Certainly the SB2 chassis is up to—if not substantially beyond—road racing quality. If you were an inspired welder, a superlative machinist and a brilliant designer and loved motorcycles more than anything else, the Bimota chassis is what you'd hope to build for yourself. It's light—just over 20 pounds—and it gives every impression of being terribly strong. Made of thin-wall chrome-moly steel tubing of differing diameters, the chassis uses the engine as an integral load-carrying member. Twelve separate tubes converge on, and locate, the steering head; eight members comprise the chassis' aft section. All but six of these twenty chassis tubes are straight, which is the way tubes like to be if they are to resist deflection. The main tubes which connect the top of the steering head with the bridgework supporting the top of the rear shock absorber are connected in pairs with conical joints. Each joint is secured with three Allen-head bolts. These are the only points at which the front segment of the Bimota chassis is directly in contact with the rear. The engine—which as a chassis member has far more strength and integrity than any amount of frame tubing—forms the primary bridge between steering head and swing-arm pivot structure. The chassis' front part uses the forward motor mount bosses; the rear part bolts up to the back of the engine.

The main bodywork item, that part which accommodates the fuel tank and seat, is supported on four individual prongs, two horizontal at the front and two vertical at the rear, which engage four rubber-bushed receptacles welded to the chassis. Disconnect two battery lead junctions and one gang plug, release the two rubber securing straps in front of and below the seat, disconnect the fuel line, and the entire upper body lifts off—revealing what has to be the most rigorously gusseted steering head in all of motorcycling, a rack of air-cleanerless standard Mikuni carburetors, an electrical junction complex (supplied in the kit), the top part of the Suzuki engine, and all the craftsmanship, ingenuity and quality which make the Bimota worth the money.

It wouldn't be worth dime one if it didn't work out on Racer Road—and boy, does it ever work. Granted, the SB2 is hardly the most comfortable motorcycle ever created—the seat is the pits, the clip-on angles are fouled up, the shift lever pitch is wrong, and the suspension contributes a whole new dimension to the practice of self-abuse—but the bike can get into, around and out of corners like only one other motorcycle we've ever ridden: the Suzuki RG500 square four GP road racer. The Ducati GT750 and 900 and 750 Super Sports are as stable at high speeds, but their wheelbase length (about 60 inches), cornering clearance limitations and rather extreme front-end geometry make them less than nimble. The Bimota is far heavier than the RG500, and it carries its center of gravity significantly higher since the 750 engine is much wider than the 500. But it generates the same feeling of absolute solidarity at high speeds and through all kinds of camber changes and surface irregularities, remaining all the while willing to change direction, attitude and speed. Our only handling complaint—which really is more of an observation—concerns using the front brake going into a decreasing radius corner. Do so and you can feel the bike's front end wanting to return to a vertical attitude, a characteristic hardly unique to bikes with high centers of gravity and forward-mounted calipers. The bike does nothing else which can be described as "needing im-

(Continued on page 119)

NOW YOU CAN BECOME MORE THAN A MOTORCYCLE MECHANIC!



Be a Motorcycle Mechanic PLUS a talented Motorcycle Manager.

...Maybe Even Open Your Own Shop!

Get your training at American Motorcycle Institute and be MORE than a MECHANIC.

Here's how you get started. Contact us right now by sending in the attached card. At American Motorcycle Institute here in exciting Daytona Beach — motorcycle capitol of the world — we train men and women in the basics. Everything from minor tuneups to major overhauls (plus management training ... read on.) We fit you out to work on the big bikes and make your own money. You get 7½ hours a day of classroom and live laboratory instruction in the 37 necessary skills. You'll have shop work in our huge service center. You'll be working alongside guys and gals just like yourself. You'll learn from mechanic pros who really know their stuff and know how to teach you. It's 15 weeks of tough, in-residence training, and we demand a passing grade of 85 to qualify you.

Movin' on up to bigger things.

After you complete your initial motorcycle mechanic training, you go on to better things. Additional in-residence training, then prepares you with all the skills you need for PARTS COUNTERMAN, PARTS MANAGER, SERVICE MANAGER, MOTORCYCLE SALESMAN, SALES MANAGER, and GENERAL MANAGER. These are the big jobs where your potential is your only limit.

And after training ... when you leave us and get out into the real world of motorcycle repair, you'll probably start as a mechanic or parts man, but with the additional management knowledge you will have learned, your promotion is the next step up. You won't be held back while other mechanics get promoted over your head. You'll be the one who's prepared for promotion after promotion because you WILL HAVE ALREADY GAINED THE NECESSARY KNOWLEDGE.

Tough track with big rewards at the end.

There's nothing easy about training for a professional career in the motorcycle industry — we'd be lying if we said there were. But, if you have the basic skill, we can train you to develop that skill and become a real pro. So do some thinking for yourself. If you like to work with your machine ... if you want a career that satisfies you ... if you want a job where you control the action ... if you want to make your money doing what you like best — working with motorcycles ... then write us today. Just fill in the attached card or complete the coupon and mail it. Or, if you want instant action, give us a call at our toll-free number, 800-874-0645 (In Fla. call collect 904-255-0295).

Be a motorcycle mechanic and more!

We also train marine stern drive & outboard mechanics.

There's a long, successful, satisfying track ahead of you, so flip your starter today. Mail the coupon — it's your first step toward a future you've probably always dreamed about. Waiting for you at the end of your training are the big rewards — satisfying work. a comradeship with other guys like yourself . . . money and management. Mail your coupon today.

APPROVED FOR VETERANS

AMERICAN MOTORCYCLE INSTITUTE
1445 SKYTROOPER ROAD
DAYTONA BEACH, FLA. 32014

PLEASE SEND ME MORE INFORMATION

CYCLE
- ☐ MECHANIC
- ☐ DEALERSHIP MGMT

MARINE
- ☐ MECHANIC
- ☐ DEALERSHIP MGMT

78-9-10-1

NAME ______________________________

ADDRESS ______________________________

CITY ________________ STATE ________ ZIP ________

PHONE (___) ________________ AGE ________ VET ________

CALL TOLL FREE (800) 874-0645 Fla. residents call (904) 255-0295 collect

CYCLE DIRT TEST

KAWASAKI KX250-A4

Kawasaki returns to 250cc motocross with a vengence. At 219 pounds the KX250-A4 is the lightest 250 motocrosser available. Armed with 27.6 horsepower, the bike is fast—and it's a quick, responsive handler. At last, the Green turns mean again.

● THE COLOR OF MOTOCROSS IS SLOWLY changing. Once upon a time, the biggest challenge in racing was outfitting yourself with unique and noticeable riding gear that went with your yellow bike. In part, Honda upset the color scheme of motocross with the introduction of the bright red CR250R. And now Kawasaki has returned with a new green machine for 250 motocross. And what a dazzler the KX250-A4 is: gold-anodized aluminum swing arm and matching rims, lightweight plastic fenders and number plates, hollow axles front and rear, drilled and anodized aluminum motor mounts, and aircraft lock-nuts everywhere.

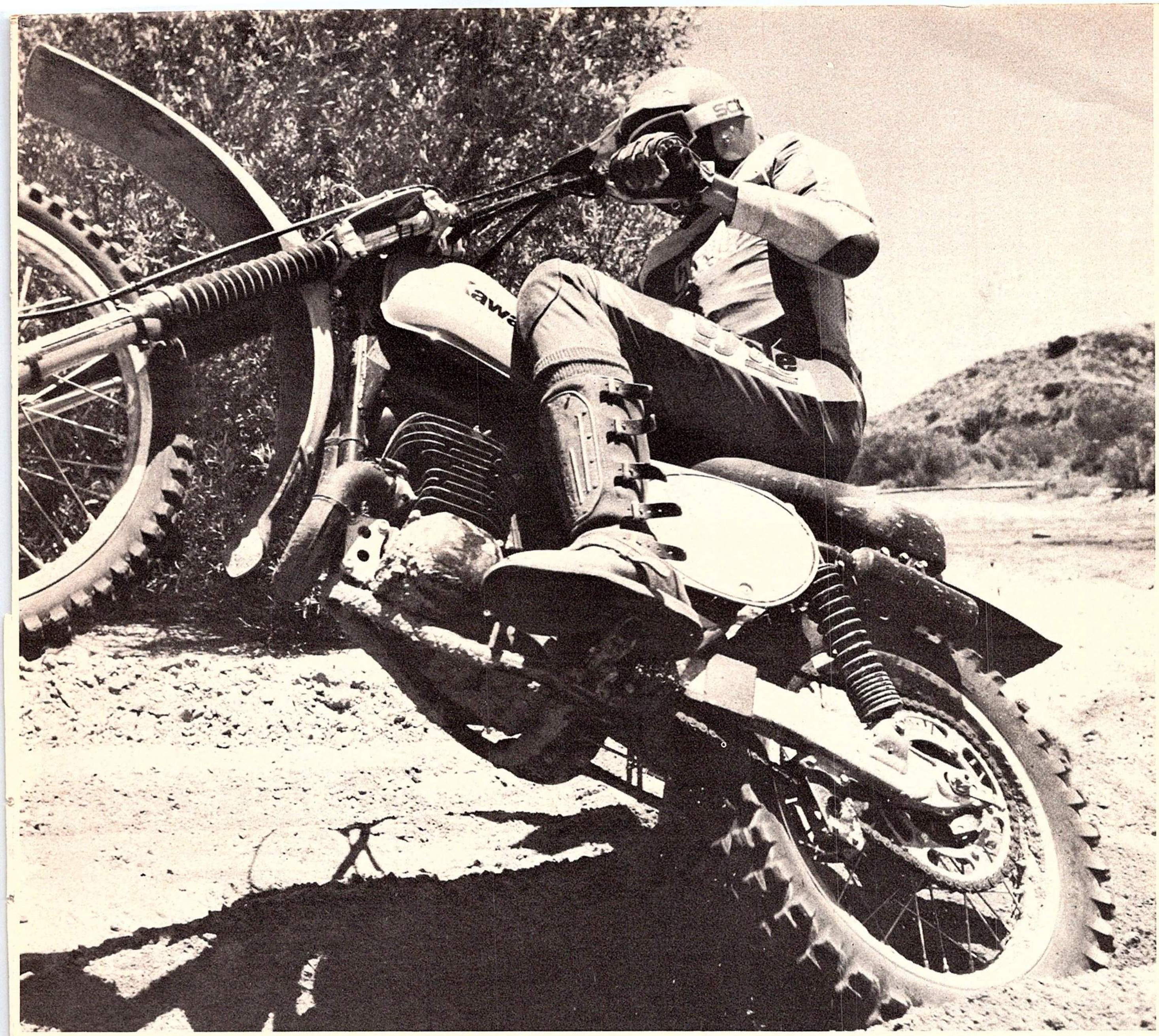
The KX250-A4 looks exactly like the bike it is—a limited-production motocrosser for expert-level riders. Usually a bike is delivered to our offices and then returned to the manufacturer after the riding evaluations, internal inspections and dyno runs have been completed. But Kawasaki handles things a bit differently. To insure that this uncompromised motocrosser would be maintained like an all-out race machine, a representative from Kawasaki met us with our freshly prepared KX and stayed with the bike every day of the testing. He carefully attended to spokes, drive chain and tire pressures. When one day's testing was completed, the bike would be returned to Kawasaki's racing department for inspection and preparation for the next day's testing. Given this careful shepherding, the bike performed flawlessly.

Like the smaller 125, the KX250 is the lightest bike in its class we have tested. Tanked-up, the bike weighs 219 pounds. That is 10 pounds lighter than the Yamaha YZ250E and eight pounds under the CR250R Honda. The lightness of the machine is apparent everywhere on the track. Off the starting line, the front tire just skims the terrain, and in turns the KX is nimble and agile. With some heavier machines, you must force a bike over on its side in a turn, but the Kawasaki makes squaring corners a snap and berm-shots easy. The bike responds quickly to weight shifts by the rider and to all steering inputs. In rough whoop-de-doo sections, a slight twist of the throttle and a small weight transfer rearward will loft the front tire and bypass the mounds.

PHOTOGRAPHY: DAVE HAWKINS

The feathery weight of the KX250 results in a bike that demands concentration when exiting turns. A sloppy rider who isn't properly seated forward near the green tank may soon see the other team color, sky blue. A good rider, of course, won't have this problem, and all riders will benefit from the KX250's lightness, especially in long motos. In these circumstances, even a donk rider can race longer and harder if he doesn't have to haul around a lot of excess baggage.

The lightweight single-downtube frame is tubular alloy steel. Diameters vary according to stress loads; the frame tapers from 35mm at the downtube to 22mm for the rear seat mount. The steering stem area is heavily gusseted to the main backbone tube, and there's more heavy-duty gusseting at the rear section of the engine cradle near the swing-arm pivot. To damp



vibrations and form an additional engine mount, a head stay runs from the rear of the cylinder head to the junction of the frame's main backbone and airbox area. Stays are common to larger-displacement motocross machines and a few of the larger-bore single-cylinder street bikes. The KX stay reduces vibrations by securing the engine more firmly within the frame's cradle. With the KX's frame (not chrome-moly), the increased rigidity produced by the stay reduces the stress on the other engine mounts.

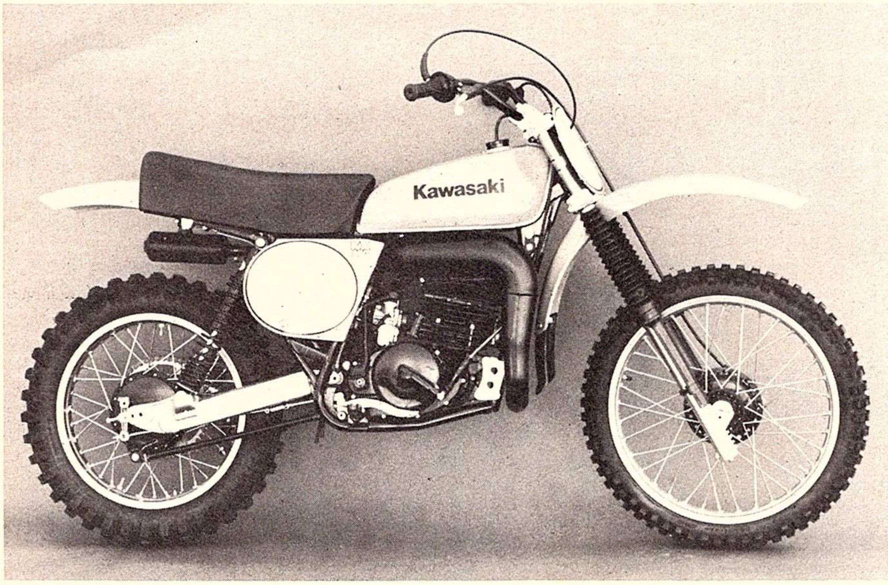
The frame has its share of tapered roller and needle bearings. The steering stem load is supported by tapered roller bearings, while the swing arm pivots on four needle bearings. There's even a bearing support for the brake torque arm. Tapered rollers in the steering head give much more bearing area to support the triple clamps and front end than loose, uncaged ball bearings, which will soon brinell under constant pounding.

The front suspension is a KYB-manufactured air-charged, oil-damped fork. The air volume couples with the three internal springs to give a progressively sprung ride and 9.25 inches of travel. The longest of the three springs (14 pound-inch rated) couples with a shorter (5.5 inches) spring to give a dual rate. The shortest spring in the fork is only one inch long, and its sole function is to prevent the fork from clanking when it tops out over jumps. Five cooling fins are cast into the bottom of each slider; they serve to increase the cooling area for the 270cc of oil in each fork leg. The ideal fork pressure for our riding proved to be 12.5 pounds of air in each leg. At lower levels, the fork bottomed out over larger whoops and was too soft on the braking bumps before a turn. With higher pressures, the fork was quite stiff and transmitted the smallest shocks from tiny bumps directly to the rider's arms.

KYB also makes the remote-reservoir shocks on the Kawasaki. The bike's rear suspension offers 8.5 inches of travel. The shock itself has a travel of 5.9 inches with the 20mm rubber stops compressed 50 per cent. Although the shocks worked well, the under nine inches of travel is a bit short-legged compared to the other leading 250s. Kawasaki's factory team riders mount their shocks at an extreme laid-down position relative to the stock KX. The standard KX uses a 55-93 pound-inch dual-rate spring on the rear and this spring rate matches up with the rest of the bike nicely.

The reservoirs are connected to the top of the shock bodies by an oil line that leads forward to the rear of the engine cradle where the reservoir is mounted. Separate reservoirs can be large enough to increase the oil capacity significantly and help the dampers resist fading. The shocks are tucked in and do not cause an annoying bulge in the number plates.

The A4's aluminum swing arm is massive. The square-section main body of the arm is heli-arced to a rear I-beam section. The lower shock mount intersects the



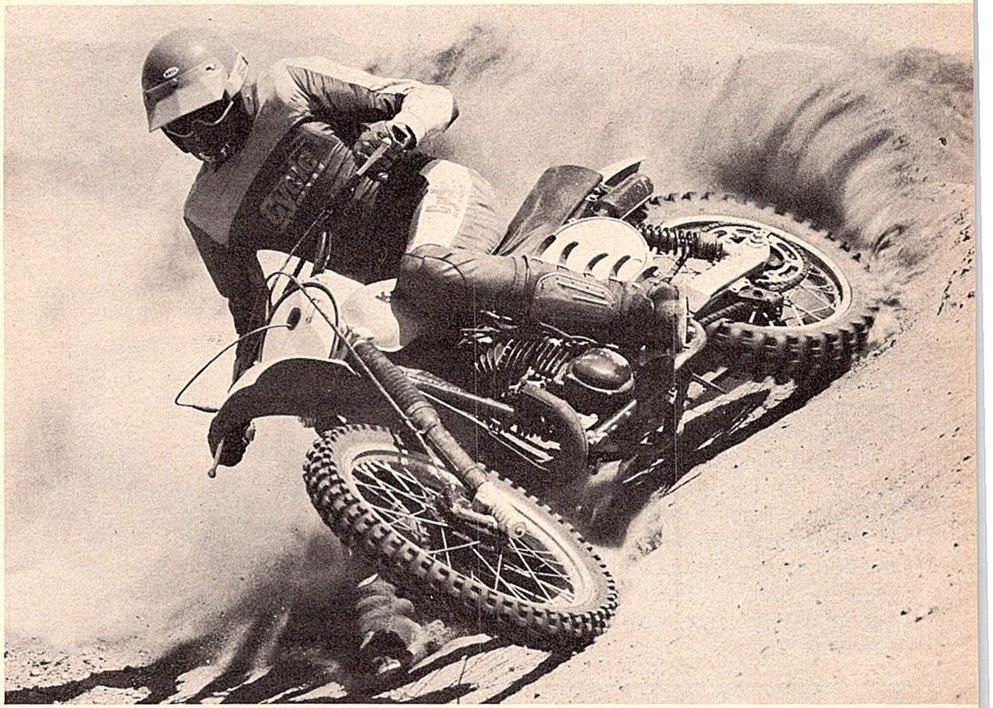
junction of the square-section arm and the I-beam axle-mount section. With all the heli-arc junctions, the shock location appears to be strong enough to support an open class bike easily. The arm has a conventional chain guide near the rear sprocket and a roller support near the swing-arm pivot mounted on the frame. A replaceable chain skid pad is wrapped around the arm to prevent scuffing of the arm by a loose chain.

The KX250-A4's engine has one unique feature: Kawasaki's patented wire-explosion coating on the cylinder wall. Each unfinished cylinder has its ports plugged, and it's then fitted on a machine that feeds 15 separate wires through the center of the cylinder. A 16,000-volt current is applied to the wire, and the wire's center is vaporized by the voltage surge. A millisecond later the wire explodes and coats the cylinder wall with particles of the wire.

This new system has apparently solved many problems presented by the use of iron sleeves or chrome-plated bores. If an iron sleeve is inserted into an aluminum cylinder casting, hot spots develop at any place that the liner and the cylinder have not formed a perfect fit. Inevitably there are slight misalignments between the liner windows and the cylinder ports. Chrome-plating the cylinder eliminates problems of fit but presents a number of maintenance problems.

Fifteen separate explosions effectively "spray" coat the cylinder with combinations of pure molybdenum wire and high-carbon steel wire. Each explosion coats the cylinder with .0005-millimeter particles. The first three molybdenum-wire blasts form a strong bond between the cylinder and the subsequent wire coatings. The next six applications alternate between the moly wire and the carbon wire. These coatings actually impregnate each other to form an evenly distributed mix. Tests were conducted with alloy (carbon and moly) wire, but though this shortened production time, the coating was not

Hollow axle, full-length leg protectors and cast-in cooling fins highlight the 9.25-inch travel front fork.



as homogeneous as the alternating wire method.

The entire cylinder coating is only 70 microns thick after the last three blasts of carbon wire are honed away. One micron is .001-millimeter, or .000039-inch. The thin wall coating permits rapid heat dissipation, and the ports are perfectly aligned.

The coating provides a porous (moly wire) yet hard (carbon wire) surface. According to Kawasaki's wear indicator tests, the KX cylinder will resist seizures under extreme test conditions. One test included feeding silt into the cylinder; even then the KX cylinder survived the silt-torture test with half the wear of a conventional iron-sleeved engine.

The charge is fed to the cylinder through a still air box and a 38mm Mikuni. A foam pad is glued to the back of the right-side number plate that covers the opening to the air box. By simply removing two number-plate screws, the air cleaner is readily accessible. An easily serviced air cleaner will undoubtedly be cleaned more often than one that is hard to reach, so Kawasaki has helped insure maximum cylinder life by putting the air cleaner in quick reach.

Commonly, most test motocrossers *Cycle* receives are jetted rich and have the ignition timing advanced. The KX was no exception. The bike blubbered throughout the mid-range powerband. After rejetting the carb, the KX was running very strong in a few laps. As a guide, we ran the bike at an elevation of about 250 feet and in temperatures ranging from 65 to 85 degrees F. The main jet was changed to a 162.5, the pilot jet a 50.

Before entering the cylinder, the charge passes through a six-petal reed block. The reeds appear to be fiberglass, but Kawasaki technicians assured us that they are a special plastic composition. During our test period, the reeds did not fret at all and gave clean carburetion throughout the power range. The flapping of the reeds is cushioned by a rubber dip coating on the reed's V-shaped block. The main intake port is a large single-opening port that opens into the crankcase. The KX also has two smaller "boost" ports that tunnel from the reed block area directly into the crankcase. The cylinder uses four transfer ports and dual, bridged exhaust ports.

The chamber wraps around the single down tube of the frame and up along the right side of the engine. The pipe is gradually tapered throughout the belly section of the chamber; an irregular dual taper is used to clear the frame near the seat/tank junction where the pipe crosses through the frame. The dual tapered cone will disrupt, to a small extent, smooth exhaust gas flow, and there may be a slight loss in power for this reason.

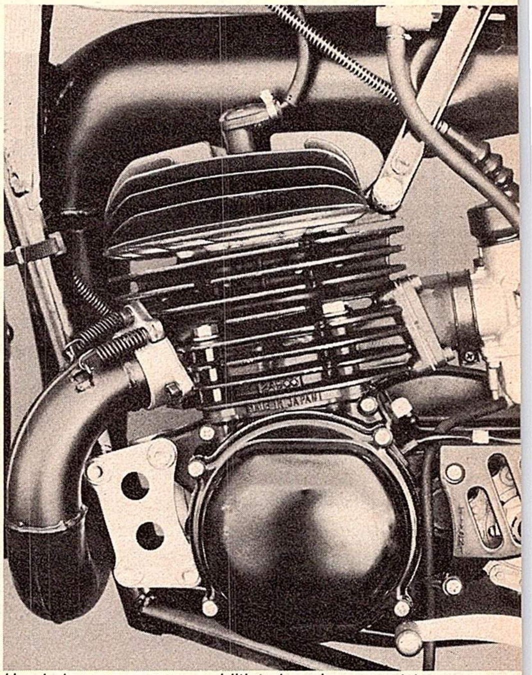
KX250s require some modification to their pistons, and Kawasaki dealers have been sent technical bulletins regarding this situation. The stock piston is a two-ring Dykes model. Some early KXs seized pistons in the exhaust bridge area, and so follow-up bulletins have advised filing a .020-inch relief on the piston where it contacts the exhaust bridge. Also, the two oil holes in the piston on the exhaust side must be chamfered.

We had a chance to inspect a seized (unmodified) piston and cylinder; although the piston was badly scored, the cylinder wall was still operational. On our bike, with the modifications, the bike ran strong throughout our testing and also survived our dyno runs without incident.

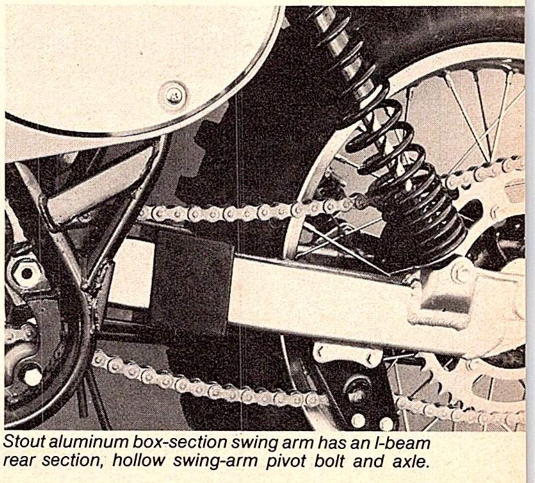
The KX has a five-speed constant-mesh transmission. The gears are straight-cut, and shifts go through neatly once you become accustomed to the throw. The gear box does not operate as smoothly as the one on a CR250 Honda, but the Kawasaki's is much better than, for example, a CZ's. The ratios of the gears are ideal for motocross.

On the track the bike feels much quicker than the dyno figures indicate. The machine's low weight does not show up on horsepower numbers, but power-to-weight ratio certainly counts on the track. The KX250 produced 27.56 horsepower at 7500 rpm. While the figures aren't overwhelming, they are respectable. At a local motocross race our stock A4 exited the first turn in third and first places in the two motos.

The Kawasaki's peak power at 7500 rpm is the exact rpm that both the Yamaha YZ250E and the Honda CR250R reached their maximum outputs. However, the KX is more than two horsepower down on the Honda but one horsepower up on the Yamaha YZ250E *Cycle* first tested in April 1978. Given three bikes that close in power, the rider who shuts off last going into the first turn will have the



Head stay serves as an additional engine mount to increase frame rigidity; it also helps mute vibrations.

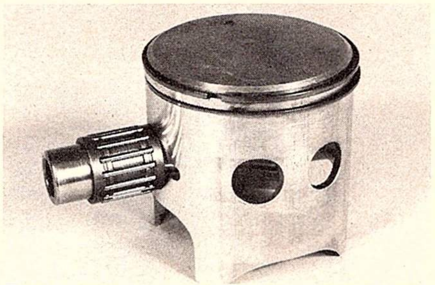


Stout aluminum box-section swing arm has an I-beam rear section, hollow swing-arm pivot bolt and axle.

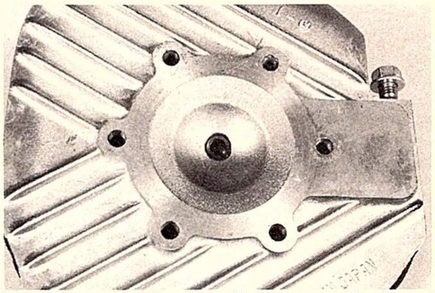
advantage and the holeshot.

The gold-anodized DID alloy rims are both strong and light. The front 1.60 x 21-inch and rear 2.15 x 18-inch rims complement the bike's bright green. The conical front hub has a magnesium backing plate; the rear hub is also conical and it, as well as the backing plate, is magnesium.

The stock Dunlop tires are also light. The rear tire, a four-ply 5.00 x 18-inch Sports K-88, is about a half-pound lighter than a Metzeler and is far less expensive, two important considerations for mass-produced machines. The tire performed nicely on hard-packed as well as sand courses. The front tire is also lighter than a comparable Metzeler—and that's the only good thing we can say of the front rubber. The tire pushed or plowed, depending on track surface. The KX's rake of 30 degrees felt more like 40, because the front tire just refused to grip any kind of dirt we rode on. The front tire (and the handgrips) should be replaced *before* you leave the shop.



The KX uses a two-ring piston that will require hand-relieving in the contact area with the exhaust bridge.



The KX's cast aluminum head has a concentric shaped combustion dome with a wider-than-usual squish band.

Despite the front tire, the front brake worked extremely well. The strong, progressive front brake not only tolerated but encouraged deep dives into corners. The front shoes are only six inches in diameter, but their small size belies the stopping strength. The rear brake is a full-floating unit. The torque arm secures the backing plate to the frame so that braking loads are fed into the frame rather than into the swing arm where the shocks would compress in braking.

On its reentry into motocross, Kawasaki has played its best hand. The 250-A4 is a solid racing package. Changing rear shock absorbers, tires and handgrips will propel the KX from the middle of the thundering pack to a front runner. As a limited production motorcycle the A4 bike has been a way for Kawasaki to "test the (motocross) water." With the 250-A4, Kawasaki has discovered that the water is just fine. The yellow stranglehold on 250 starting lines across America has already been broken by the bright green KX-A4. ◉

Make and model	Kawasaki KX250-A4
Price, suggested retail	NA

ENGINE

Type:	Two-stroke, air-cooled single cylinder
Bore and stroke	70 x 64.9mm (2.76 x 2.56 in.)
Piston displacement	249cc (15.91 cu. in.)
Compression ratio	7.6:1
Carburetion	1; VM38SS Mikuni
Exhaust system	Expansion chamber with silencer
Ignition	Magnetically triggered, magneto-energized electronic CDI
Air filtration	Oiled foam
Oil filtration	None required
Bhp @ rpm	27.56 @ 7500
Torque @ rpm	20.46 @ 6500

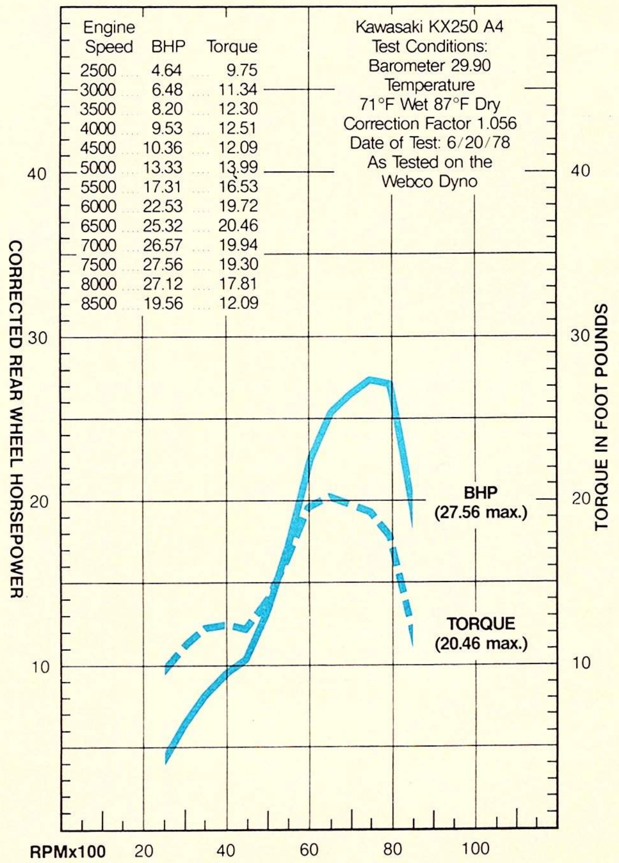
TRANSMISSION

Type:	Constant-mesh, five-speed
Primary drive	Straight-cut gears; 2.68 (59/22)
Final drive	⅝ x ¼ in. chain
Gear ratios, overall	(1) 2.33 (2) 1.73 (3) 1.41 (4) 1.16 (5) 1.00
Oil capacity	1.0 liter (1.1 qt.)

CHASSIS

Type:	Tubular steel, single downtube, semi-cradle
Wheelbase	1415mm (55.7 in.)
Rake/Trail	30°/130mm (5.1 in.)
Brake and hub, front	Drum, conical, double shoe
rear	Drum, conical, double shoe
Wheel, front	DID Shoulderless, 1.60 x 21
rear	DID Shoulderless, 2.15 x 18
Tire, front	3.00 x 21 Dunlop Sports Senior, 4pr
rear	5.00 x 18 Dunlop Sports K-88, 4pr
Seat height	914mm (36 in.)
Ground clearance	300mm (11.8 in.)
Fuel capacity	8 liters (2.1 gal.)
Curb weight, full tank	99.32 kg (219 pounds)
Suspension, front	Telescopic, forward-axle fork
rear	Remote-reservoir KYB shocks

CUSTOMER SERVICE CONTACT
Customer Relations Department
Kawasaki Motors Corp., USA
3630 Garry Ave.
Santa Ana, CA 92704
Attn: Consumer Services



Engine Speed	BHP	Torque
2500	4.64	9.75
3000	6.48	11.34
3500	8.20	12.30
4000	9.53	12.51
4500	10.36	12.09
5000	13.33	13.99
5500	17.31	16.53
6000	22.53	19.72
6500	25.32	20.46
7000	26.57	19.94
7500	27.56	19.30
8000	27.12	17.81
8500	19.56	12.09

Kawasaki KX250 A4
Test Conditions:
Barometer 29.90
Temperature
71°F Wet 87°F Dry
Correction Factor 1.056
Date of Test: 6/20/78
As Tested on the
Webco Dyno

BIG 4 INC.

MOTORCYCLE ACCESSORIES DIRT CHEAP!

NOW TWO LOCATIONS!

Spokane & New Seattle Store.
Both locations open 7 days a week.

Dunlop K81 MKII

Newly designed superbike tire providing large contact patch at all riding angles. Raised white letter.

5.10 x 18	**$46.05**
4.10 x 19	**42.85**
5.10 x 16	**44.28**

Dunlop K81 (TT100)

Trigonic, (for strength) low profile. Front or rear superbike tire.

3.60 x 18	**$30.88**
4.10 x 18	**36.03**
4.25 x 18	**38.81**
3.60 x 19	**32.80**
4.10 x 19	**36.65**

Dunlop K88 MX

Featuring an offset knob spacing pattern, designed to put more biting edges on the ground contact area for greater traction.

5.00 x 17	**$31.16**
4.00 x 18	**27.38**
5.00 x 18	**35.15**
3.25 x 21	**27.28**

Dunlop K190 MX

The "Dimple" blocks allow increased traction under all dirt conditions. Reinforced shoulder blocks and a rim saver protects against rocks and stones.

4.10 x 18	**$25.86**
4.50 x 18	**34.53**
4.60 x 18	**30.25**
3.00 x 21	**24.03**
3.25 x 21	**27.98**

Dunlop K81 MKII

Newly designed superbike tire providing large contact patch at all riding angles. Blackwall.

5.10 x 16	**$44.28**
5.10 x 18	**41.65**
4.10 x 19	**38.33**

master charge
THE INTERBANK CARD

VISA®

Michelin M 45

Designed for high torque acceleration and braking. Superior wet and dry road grip, front or rear.

4.00 x 18	**$39.35**
4.25 x 18	**43.60**
3.50 x 19	**37.18**

Continental K112

Extra long wearing superbike rear tire. RB 2 high performance front tire.

5.10 x 16	**$48.85**
4.50 x 17	**48.38**
3.50 x 18	**39.86**
4.00 x 18	**45.65**
4.25 x 18	**46.65**
5.10 x 18	**47.40**
4.25 x 18 Tubeless	**53.45**
5.10 x 18 Tubeless	**54.70**

Continental RB 2

High performance front tire.

3.25 x 18	**$33.70**
3.25 x 19	**37.80**
3.50 x 19	**39.20**
3.50 x 19 Tubeless	**44.83**

Dunlop K91 MKII

A High Mileage Superbike Tire featuring Kevlar bias belted construction. They are designed to be run with or without tubes.

5.10 x 17	**$53.63**
4.25 x 18	**48.15**
5.10 x 18	**51.73**
4.10 x 19	**41.48**

Yokohama 907 Super Digger

Designed by "The Man" himself, Roger DeCoster. Long lasting, super traction with a flat tread profile.

4.10 x 18	**$24.30**
4.60 x 18	**27.23**
5.00 x 18	**30.90**
5.50 x 18 4 Ply	**33.95**
5.50 x 18 6 Ply	**36.65**

Complete line of Cheng Shin and Goodyear tires also available.

All tire prices include Federal Excise Tax.

AMB
MOTORCYCLE BATTERY

AMB Batteries

Heavy duty construction batteries equal or out perform batteries they replace. Additional electrolite reservoir capacity above battery plates assures longer life. Split ring electrolite level indicator for ease in checking acid level. Zip strip vent caps allow easy inspection and addition of water — no tools required, low price. Call for prices and application to your bike.

NGK Spark Plugs

These plugs feature a copper core electrode. Copper conducts heat about five times faster than iron. So the special copper core in NGK spark plugs dissipates combustion heat much quicker than the iron cores in ordinary plugs. This cools the electrode tip and insulator tip. Cut hot spots that could cause pre-ignition.

V-Series (Racing/Competition)
Sold in boxes of 4. Each ......**$ 1.50**

Standard NGK Plugs
Sold in boxes of 10. Each.....**$ .69**

BIG 4, INC.
MOTORCYCLE ACCESSORIES
1978 WHOLESALE CATALOGUE

Call and ask for a FREE Catalog today!

Call toll free. Orders normally shipped within 24 hours. All orders shipped U.P.S., C.O.D.

W. 300 Second Ave., Spokane, WA
12004 Aurora Ave. N., Seattle, WA

To order — call toll free number

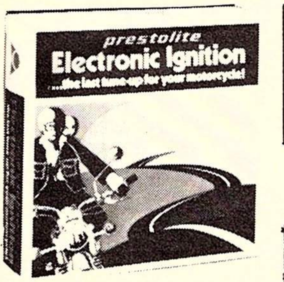
1-800-541-2677

In Washington, call toll free

1-800-572-5690

ACCESSORIES

for everybody and their bikes



NEW ELECTRONIC IGNITION

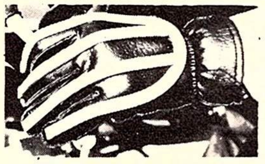
Faster starts, better performance. No more costly tune-ups. Save on fuel & maintenance. Timing remains constant, spark plugs last longer. Easy do-it-yourself installation in under an hour. The best ignition system for your Honda! **$74.50**

For Hondas 350, 360, 450, 500 twins, 350, 400, 500, 550, 750 fours, GL1000.

CHROME OIL PRESSURE GAUGE

Withstands vibration and tough usage. All chrome casing & mounting hardware. 1½" gauge dial, replaceable dial facing, no-vibration needle. Easy bolt-on mount.

For Honda	
GL 1000	$15.50
750K/F	$13.25
350F/400F/550	$16.50
For Kawasaki	
KZ900/1000	$13.25
KZ650	$16.55
KZ400	$14.55
For Suzuki	
GS750	$13.25



MOTOCROSS GLOVES Simulated leather in black. 4 sizes S,M,L,XL.
Pr. $4.95 2 pr. $8.49

RAIN-PROOF CYCLE LUGGAGE

B-STUFFER BAG — 10" diameter, 17" long. Holds two helmets and clothing. Travels securely. Three-snap flap. Heavy duty slings. Red, Blue, Black **$11.49**

C-SUPER STUFFER — 21" long, 12" diameter. All features, plus "piggy back" pouch. Red, Blue, Black **$15.49**

D-TANK BAG Straps to gas tank: 12"x10"x5". Topside map pocket and personal effects pouch. Heavy-duty sling for take-along convenience. Red, Blue, Black **$16.49**

COMPLETE SET All three bags in matching colors. Red, Blue, Black. **$40.00**

HANG TEN CAPS & STROKERS

Caps are foam lined, vented, with flex peak. Strokers have snap visors, are adjustable to all sizes. $4.95

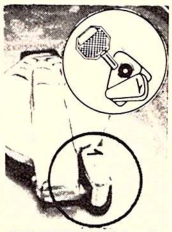
Two emblems: TEAM HONDA (red cap red stroker); HANG TEN U.S. GRAND PRIX (blue cap or white stroker)

CYCLE COVERS Form fitted, protects against all weather. Heavy gauge, cloth backed. Resists muffler heat. Contoured to all accessories. With tie straps.

Bike shown includes sissy bar & pad, windshield & fairing, luggage rack and saddle bags.

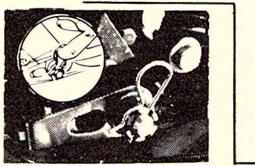
	Moped Cover	$24.95
#958	For 360cc & smaller	$27.95
#961	For 750cc & smaller	$27.95
#962	w/Sissy Bar	$28.95
#964	w/Wndshld	$28.95
#966	Sissy Bar & Wndshld	$30.95
#970	For 1000cc	$30.95
#972	w/Sissy Bar	$31.95
#974	w/Wndshld	$31.95
#976	Sissy Bar & Wndshld	$35.95

SISSY BAR CARRY-ALL LUGGAGE Fits all bars, on-off in a jiffy. Double lined, heavy duty vinyl, full zipper enclosure. Waterproof. 2-strap carry-handle, use as hand luggage. 22" high. Standard — Black only **$19.95**
DeLuxe heavy duty — Black or Brown **$29.95**



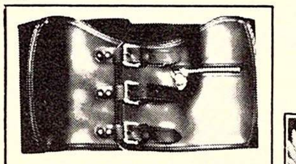
NEW GAS CAP LOCK For all Honda flip cap models, all years. Can be used with new fuel gauge (Honda only). Heavy duty. 2 keys. Easy to install. **$9.95**

FUEL GAUGE Fits all Honda flip cap models, all years. Mounts easily with Honda recall locks. Also Yamaha '75's (road) and Kawasaki '75's (road). Easily installed . . . $14.95

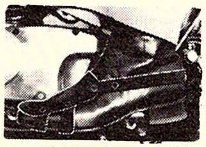


NEW! COTTER PIN Fits all. Just pull out, adjust chain, snap back in. **$1.50**

MINEOLA CRUISE CONTROL Effortless throttle control. Eliminates fatigue, wrist pains. Quick, easy on-off installation. Fits all cycles. **$2.49**

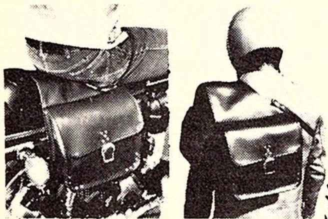


NEW ELASTIC RIDING BELT. Fully adjustable with 3 buckles for maximum back and kidney support. Zippered change pouch. 4 sizes: S-M-L-XL . . . **$11.49**

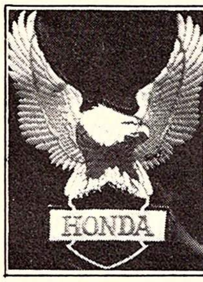


NEW CYCLE SPAT protects against abrasions, scuffing, indenting. One size fits all. Genuine leather, elastic straps. Extra strap included. Black or Brown **$3.98**

HELMET SPEAKERS Weatherproof remote speaker mounts on rear of any helmet. Fits earphone jack of transistor radio. 2⅜"x1⅛" Includes cable connectors **$9.95**
Optional 2-helmet attachment **$4.95**



"RANGO" SADDLE BAGS For on or off bike. Double duty bags fit under seat, over seat, over shoulder. Heavy duty Naugahyde with chrome plated hardware, heavy rivet reinforced. Tie down strap assures snug fit. Each bag 12" wide, 11" high, 4⅞" deep. Great innovation for free & easy travel. Set of two
Standard — Black only **$19.95**
Heavy duty (Reinforced) — Black or Brown - **$24.99**



EAGLE PATCH

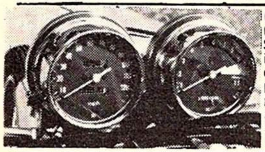
Finely detailed 7-color embroidered patch. Bronze wings, brown body, silver head and legs, yellow talons and beak. Red name on gold panel. Black velvet base. Iron-on or sew-on. Two sizes. For Honda, Yamaha, Kawasaki, Suzuki, Harley. Specify.

Giant Back Patch 8" span, 10" high
No. 77 **$8.95**
Regular Patch 3½" span, 5" high
No. 81 **$3.49**

SPECIAL PRICE $12.95

CRUISE E-Z-Z-Z

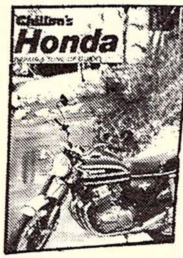
Cruise all day. Dial in a constant throttle speed, or just enough to overcome hand & arm fatigue. Easy throttle shutoff. Thumb control lever easily engages or disengages. Install in minutes — no special tools. For Honda, Yamaha, Suzuki, Kawasaki, BMW, Triumph. ~~$17.95~~



CUSTOM CHROME GAUGE COVERS Sturdy, gleaming chrome rims dress up and protect your gauges. Fit all Hondas. Specify model. Set of two **$14.95**

Quick release that works like a miniature seat belt. Polished metal. Replaces "D" rings. **$2.98**

Visit our only retail location.



TWO WHEEL ACCESSORIES

CHILTON'S REPAIR & TUNE-UP GUIDES

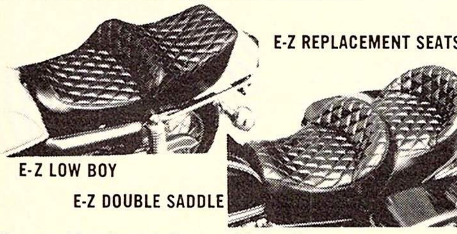
For the "Do-it-Yourselfer"

Tune up procedures, adjustments, maintenance and repair. A must for proper servicing of your bike.

HONDA		
GL1000*	'75-'77	$7.95
750	'69-'78	$7.95
350-550 Fours	'71-'78	$6.95
450/500T	'66-'76	$6.95
350/360T	'68-'76	$7.95
XL Series	'72-'75	$6.95
Elsinore Series	'73-'75	$6.95
125/200 Twins	'69-'76	$6.95
Honda Singles	'68-'75	$6.95
KAWASAKI		
Z1/1000	'73-'78	$7.95
Triples	'69-'75	$6.95
Singles	'69-'75	$6.95
YAMAHA		
Street 2-strokes	'67-'75	$6.95
Enduros	'68-'74	$6.95
4 strokes	'70-'74	$8.95
SUZUKI		
Triples	'72-'74	$6.95
Singles & Twin	'70-'74	$6.95

*Other name brand manuals will be supplied. We reserve the right to ship equivalent manuals when availability or stock prevents immediate shipment.

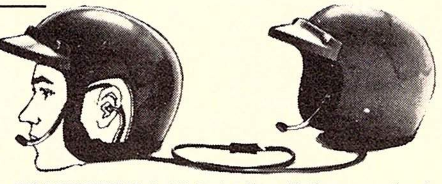
E-Z REPLACEMENT SEATS



E-Z LOW BOY

E-Z DOUBLE SADDLE

New concept in custom seats. Use your original seat base. Install pre-formed foam and cover yourself. Fits like stock. Half-hour installation complete with directions. No glueing, no cutting, no special tools needed. Available in Double Saddle or Low Boy. Black only. For Honda GL1000, CB750K/F/A, CB550K, 400 Hawk, CX500; Kawasaki KZ900/1000, KZ650; Yamaha XS1100,750-2D, 650'76 and later; Suzuki GS1000, GS750/550. **$69.95** complete



TWO WAY INTERCOM Talk while touring. Clear, effortless conversation at normal tones. No more shouting, pounding or hand signals. All plastic, non-electric, no maintenance. Adjusts to all helmets, easy to disconnect. Works hands-free. Lightweight acoustical tubing, weighs only 2 oz. **$8.95 set. 3 or more $7.60 set.**
AM/FM portable radio attachment **$3.98**

We ship Worldwide

All-steel bases used exclusively

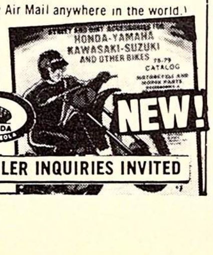
MONARCH SEAT

New custom seat of top grade Naugahyde. Contoured styling. Beautiful button tuft pattern. Uses original seat mounting hardware. Easy to install. For Honda CB550K '77-'78, CB750K '73-'78; Kawasaki 400,650,750,900/1000 all years; Yamaha 750,650, '74 & later; Suzuki GS750 '77-'78. . . **$66.95**

NOW PHONE YOUR ORDER
TOLL FREE FROM ALL STATES
800-645-6066
except N.Y., Hawaii & Alaska
or call 516-248-5775

NEW 1978-79 CATALOG $1
($1.50 by Air Mail anywhere in the world.)

FREE with all orders over $5



DEALER INQUIRIES INVITED

HONDA of MINEOLA
336 JERICHO TURNPIKE
MINEOLA, N.Y. 11501
(516) 248-5775

c 9

NAME ____________________
ADDRESS ____________________
CITY __________ STATE __________ ZIP __________
Year __________ Model # __________ Serial # __________

QUAN.	ITEM	SIZE	COLOR (1st & 2nd choices)	PRICE
N Y State residents add 7% sales tax			Add 6% Shipping (Minimum $1)	
☐ Special Handling & Dlvy $1.50 additional (optional)			TOTAL	

☐ M.O. encl.
☐ Check encl.
CHARGE MASTERCHARGE VISA
CREDIT CARD Number
Exp. Date ______
$5 Minimum on Charge Orders

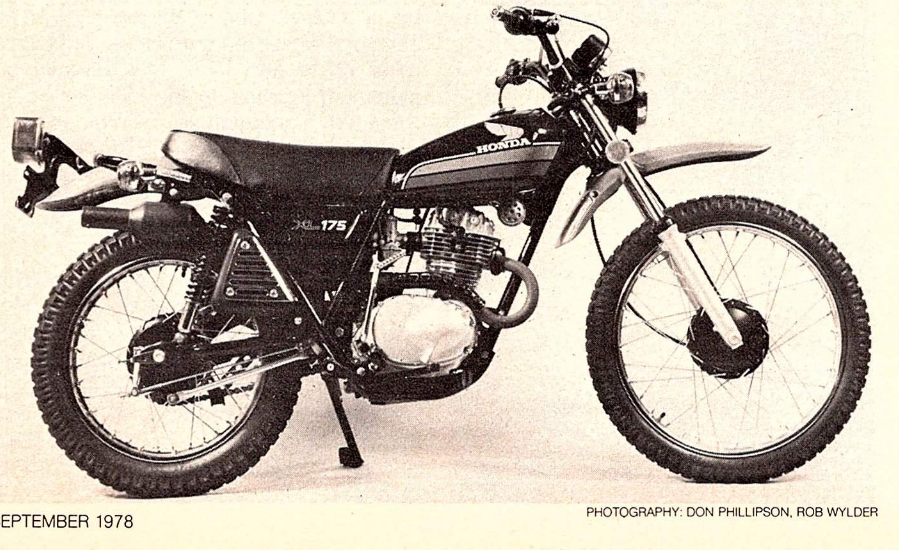
CYCLE DIRT TEST

HONDA XL175

● FANATICISM HAS NOT CHARACTERIZED THE typical dual-purpose motorcycle rider of the 1970s. Generally, he has asked for and received a dependable, inexpensive piece of transportation to travel short distances on the street and provide some thrills in the area beyond the asphalt. He has not demanded long travel suspension, off-the-chart dyno figures, plural cams, countless ports or any other flashy paraphernalia. Motorcycle manufacturers, moreover, have realized they could be slow to improve their street/trail machines because not many people, other than raving motorcycle magazine editors, have insisted upon progress.

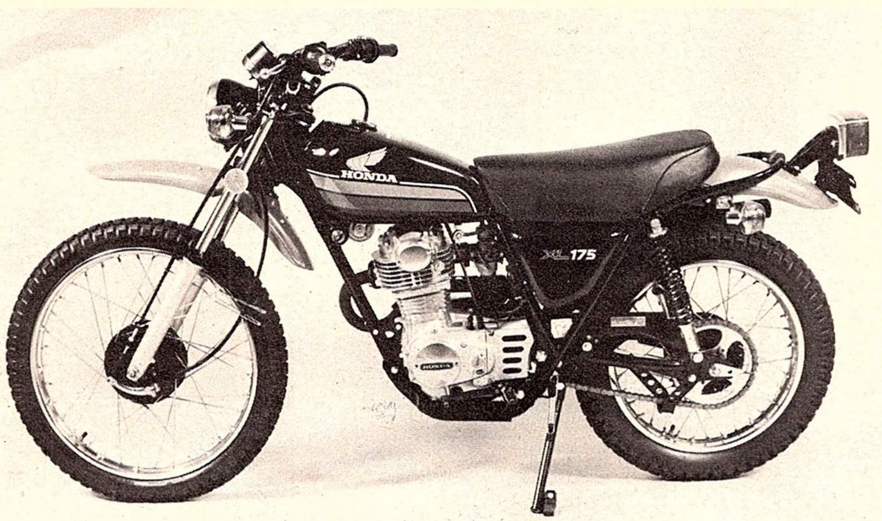
But all that's changing for many interrelated reasons. Ever-more restrictive EPA noise and emissions standards are slowly squeezing down the numbers of two-stroke street bikes—including street/trail motorcycles. But the dual-purpose bike market still exists. So to keep the market supplied with machines, many manufacturers are introducing new-model four-stroke on- and off-road bikes. These new models, however, benefit from the last five years, and these new bikes compete against an array of older machines which were introduced more than five years ago and which have been only moderately refined.

What does all this bode for 1979 and beyond? It means that the knowledgeable buyer more and more will be choosing between sophisticated and antiquated machinery. Hints of what the future holds are already with us. Hodaka has always had street/trail bikes loaded with unique features; undoubtedly they will continue to produce the same. Honda has recently brought out the very advanced XL250S, and it would be naive to believe they were not going to apply this same research and development to other displacement models. Kawasaki has introduced the straight-



Basically unchanged in three years, the XL175 offers a fair amount of power, adequate suspension, an amazing degree of vibration and proven reliability. It is also the only four-stroke, small-displacement, dual-purpose bike in production, which is why it remains unchanged.

PHOTOGRAPHY: DON PHILLIPSON, ROB WYLDER



forward KL250 and can be expected to expand their offerings. Suzuki has introduced the lightweight 370s, which have potential for very high performance. Yamaha has already monoshocked their two-stroke dual-purpose bikes, and—with their experience gained in the production of their 500s—they certainly are capable of manufacturing high-quality trail bikes. And though the only current manufacturers of street-legal trail bikes are Japanese, the proliferation of higher quality dual-purpose machines may expand the market and encourage other non-Japanese companies to join the competition, something that would work to the advantage of the consumer.

All of the major recent advances and developments regarding street/trail bikes have concerned 250cc-and-over machines. Smaller motorcycles are bound to benefit eventually from the small-scale renaissance underway, but currently progress of small machines is static. The Honda XL175 is both a good and bad example of a small bike in stasis. It is a good example because it has changed little more than cosmetically since 1976. Unfortunately, the Honda is the only four-stroke 175 now in production for the United States. If someone wants a small, four-stroke, dual-purpose bike, the XL is his one and only choice.

The XL175 carries on the tradition developed through the 1970s: functional, reliable and completely orthodox. Its last series of significant refinements came in the 1976 model year. Then, Honda fitted the 175 with a magneto ignition so that people more interested in dirt riding could detach the battery, changed the gear ratios to allow a higher cruising speed, and replaced the down-swept exhaust pipe with an up-pipe. Only paint and decals were changed on the 1977 XL; this year's model has different fork seals to help reduce stiction.

A 173cc single-cylinder engine powers the XL. Dry and with carburetor attached, the engine weighs 67.3 pounds, average for a 175. It has a single overhead camshaft which the crankshaft turns via a roller chain; the cam rides directly on aluminum journals in the cylinder head. Provided lubrication is maintained, this simple design is reliable and durable. The cam operates one intake and one exhaust valve, a setup in contrast to the four-valve systems of the XL250 and 350. Bore and stroke is oversquare at 64 x 54mm. The crankshaft rides on ball bearings and has a centrifugal oil filter mounted on its right end. Differing from the XL250 in another respect, the 175 has no separate engine counterbalancing system because it is generally and correctly presumed that engines below 250cc do not generate enough vibration to warrant counterbalancers.

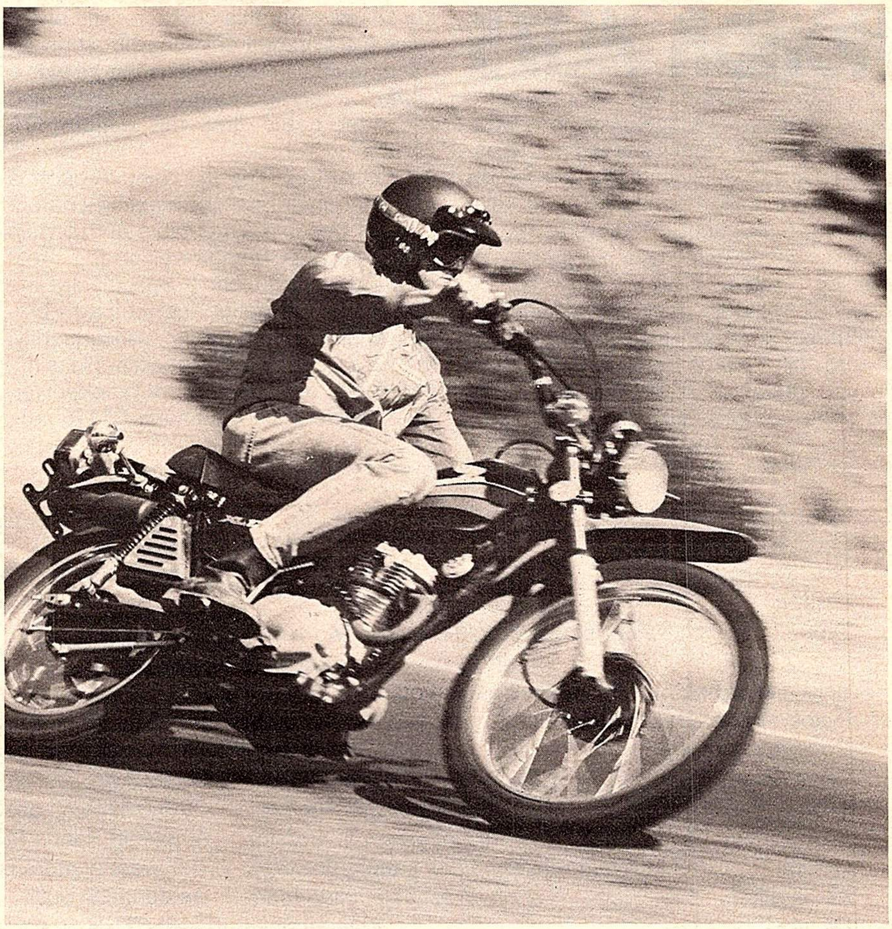
Equally straightforward in design is the drivetrain. A wet, 10-plate clutch is driven by a straight-cut primary gear. The high primary gear ratio, 3.700:1, results in the use of a 14-tooth countershaft sprocket mated to a 42-tooth rear sprocket which produce a low 3.00:1 final drive ratio. A hefty 520 chain transfers the XL's power, and it is unusual and good for a stock small-displacement dual-purpose bike to have a chain of adequate strength. Both the mainshaft and the countershaft are pressure-lubricated, increasing reliability and longevity. Lightweight magnesium cases house the transmission and lower end.

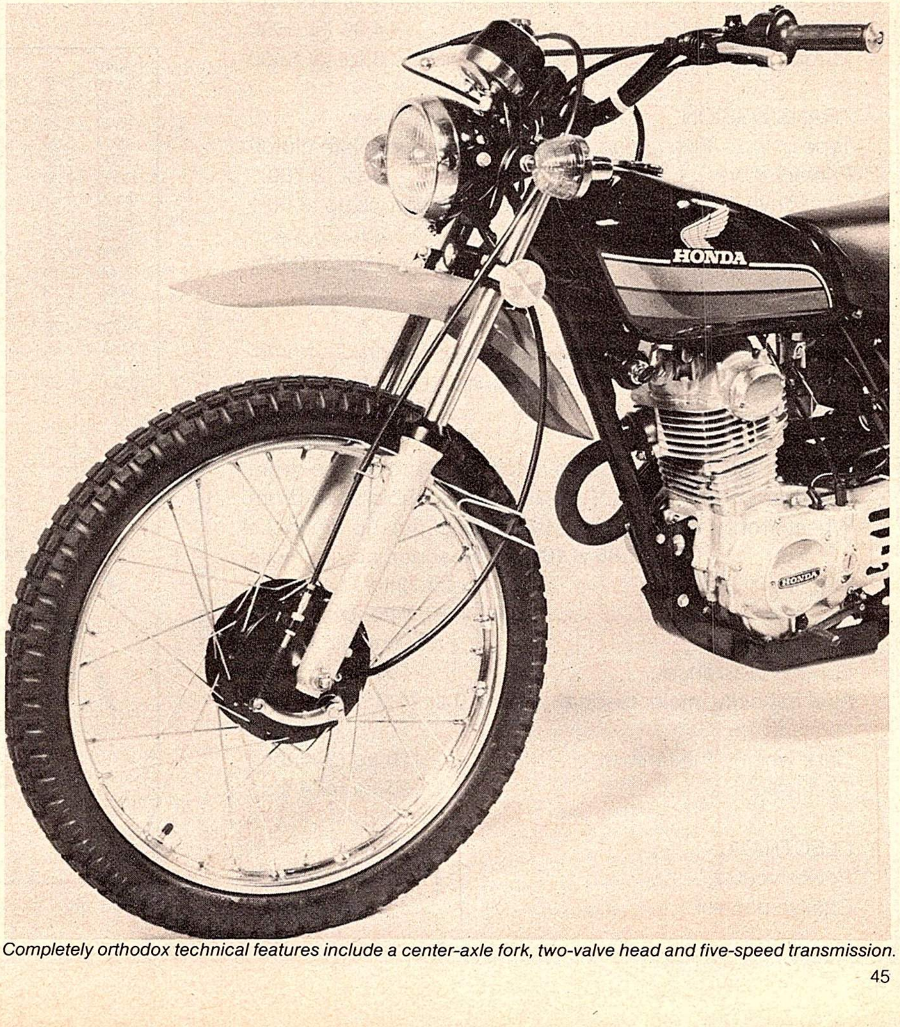
All other aspects of the powerplant are also standard. Air passes through an oiled foam air cleaner to the 26mm Keihin carburetor. A heavily muffled exhaust pipe completes the induction-exhaust cycle. Since the ignition is magneto-powered, in order to be street legal the XL175 has a six-volt battery and alternating-current generator powering the lights. The Honda doesn't have pointless ignition; the breaker points are mounted on the camshaft, and this system has proven to be reliable with minimal need for points adjustment.

A single-downtube frame cradles the engine and has a large skid plate attached to protect the cases. Chassis dimensions produce a bike which feels comfortable, especially to smaller people. The steering head angle (29.5 degrees) is slightly under neutral, but the trail (5.2 inches) is longer than average. Wheelbase is a standard 53 inches. With a seat height of 32 inches, the XL is low, but the cost for this convenience is reduced ground clearance (eight inches) which could pose problems in rocky terrain. Weighing 254 pounds full of gas, the Honda is heavy for a 175cc bike, but because the entire machine is short the weight is carried low and the bike does not feel this heavy. The seating position is comfortable, though the seat is definitely firm. The small 1.8-gallon tank is unobtrusive, and the rider can go 90 miles between stops on the 50-mpg 175.

Around town, the XL's broad powerband is its most notable characteristic. The rider can shift quickly up to third or fourth and use these gears for speeds from 10 to 40 mph. However, vibration through the footpegs plagues the XL rider when he's on the street. While not especially irritating below 35 mph in fifth gear, every additional mile per hour above 35 increases the vibration terribly. At 55 mph in top gear, the buzzing dances the rider's feet all over the footpegs. This is a direct and predictable result of the footpeg mount doubling as the rear motor mount. Other than manufacturing convenience and economy, there is no reason for this design, and a new mounting position is in order.

Other than the electric footpeg, the XL functioned acceptably well as a street





Completely orthodox technical features include a center-axle fork, two-valve head and five-speed transmission.

bike. Clutch action was very smooth; though shifts were a bit clunky, none were missed, and the clunkiness did not translate into any driveline snatch. Carburetion was clean, and the engine built revs smoothly throughout the powerband.

In low-speed riding, the fairly soft suspension soaked up all the small bumps pocking city streets. At higher speeds, the center-axle fork and five-way adjustable shocks still worked well, but the short chassis produced a general feeling of instability; coupled with the bike's high-speed vibration, this characteristic effectively discouraged anything but short intracity jaunts. In tight traffic, the XL was a comparatively lightweight street bike, and the rider could flick the nimble 175 around.

On the trail, the XL went through a curious transformation: irritating characteristics became acceptable and certain items which performed well on the street deteriorated in function. Specifically, the rider could not notice the footpeg vibration when he wore boots. Consequently, the XL's power was especially pleasing; the Honda developed more horsepower, for example, than a Yamaha DT175, and the XL175 could carry the rider over any trail the tires could stick to. Moreover, the small chassis, which was accountable for a lack of high-speed stability on the street, was acceptably stable in the dirt. This change was simply a result of the XL's inability to go more than 40 mph over rough ground. When the 175 could be coaxed to higher speeds over nasty terrain, the instability returned.

The suspension also inhibited the XL's dirt capabilities.

The six inches of fork travel were quickly taken up in rocks or over whoops, and the 4.5-inch-travel shocks faded quickly and nearly locked up in any ex-

Make and model	Honda XL175
Price, suggested retail	$918

ENGINE

Type	Four-stroke, single-cylinder, two-valve, single overhead camshaft
Bore and stroke	64.0 x 54.0mm (2.52 x 2.12 in.)
Piston displacement	173cc (10.6 cu. in.)
Compression ratio	9.3:1 (full stroke)
Carburetion	(1) 26mm slide-throttle Keihin
Exhaust system	Upswept pipe with silencer/spark arrestor
Ignition	Inductive, breaker-points, battery-powered
Air filtration	Washable, oiled foam
Oil filtration	Wire strainer
Oil capacity	1.5 lit. (1.6 qt.)
Bhp @ rpm	14.06 @ 9500
Torque @ rpm	8.62 @ 8000

TRANSMISSION

Type	Five-speed, constant-mesh, wet-plate clutch
Primary drive	Gear, 3.700:1
Final drive	520 chain, 14/42 sprockets, 3.00:1
Gear ratios, overall	(1) 2.769 (2) 1.882 (3) 1.450 (4) 1.173 (5) 0.884

CHASSIS

Type	Single-downtube, full-cradle frame; center-axle fork, swing-arm suspension
Wheelbase	1360mm (53.5 in.)
Rake/Trail	29.5°/132mm (5.2 in.)
Brake, front	Cable-actuated, double-shoe drum
rear	Rod-actuated, double-shoe drum
Wheel, front	D.I.D. 1.60 x 21-inch steel rim; no rim locks
rear	D.I.D. 1.85 x 18-inch steel rim; no rim locks
Tire, front	2.75 x 21 Nitto Trials, 4 pr
rear	3.50 x 18 Nitto Trials, 4 pr
Seat height	800mm (31.5 in.)
Ground clearance	190mm (7.5 in.)
Fuel capacity, main/reserve	7.0 lit. (1.8 gal.)/2.0 lit. (0.5 gal.)
Curb weight, full tank	120 kg (264 lbs.)
Test weight	197 kg (434 lbs.)

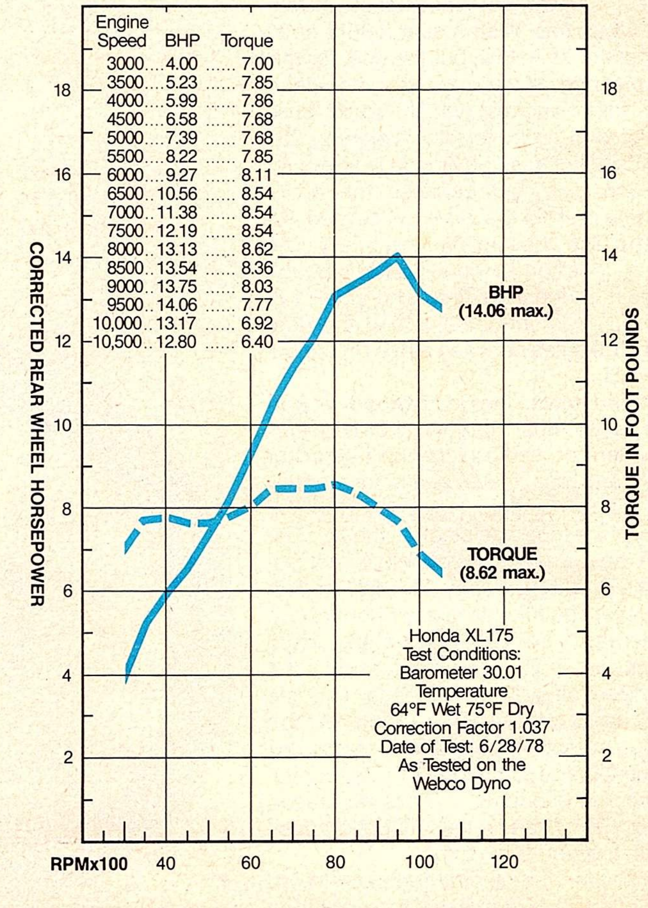
ELECTRICAL

Power source	Flywheel magneto
Charge control	Regulator
Headlight beams, high/low	25W/35W
Tail/stop lights	3cp/32cp
Battery	6V 6AH

INSTRUMENTS

Includes	70 mph/110 kph speedometer; odometer; trip meter; neutral light indicator; turn signal indicator; high beam indicator

CUSTOMER SERVICE CONTACT
Customer Relations Department
American Honda Motor Co., Inc.
100 West Alondra Blvd.
Gardena CA 90247
(213) 321-8680



Engine Speed	BHP	Torque
3000	4.00	7.00
3500	5.23	7.85
4000	5.99	7.86
4500	6.58	7.68
5000	7.39	7.68
5500	8.22	7.85
6000	9.27	8.11
6500	10.56	8.54
7000	11.38	8.54
7500	12.19	8.54
8000	13.13	8.62
8500	13.54	8.36
9000	13.75	8.03
9500	14.06	7.77
10,000	13.17	6.92
10,500	12.80	6.40

Honda XL175
Test Conditions:
Barometer 30.01
Temperature
64°F Wet 75°F Dry
Correction Factor 1.037
Date of Test: 6/28/78
As Tested on the
Webco Dyno

tended harsh use. Finally, where a 254-pound street bike is relatively light, an equal-weight 175cc dirt bike is on the cumbersome side.

The steel rims held their spoke adjustment; however, neither front nor rear had a rim lock, and for any but casual dirt use locks are necessary. The 2.75 x 21-inch and 3.50 x 18-inch Nitto trials tires demanded cautious riding over wet asphalt and spent a fair amount of time sliding about in the dirt. But this latter trait is actually quite useful and entertaining on a 175cc bike, which often cannot power up steep sections when given perfect traction.

Stylistically, the XL175 is indisputably a success. Everyone from staff members to local gas station attendants, thought the bike was trim- and good-looking. The orange fenders complement the orange and red tank decals, and the black tank and side panels offset the color.

All the Honda XLs have similar histories. From the 100 to the 350, these bikes have been big sellers. With the exception of the 250, none has changed radically through the years or offered state-of-the-art technology. Above all, each model in the XL series has an extraordinary record for reliability. The XL175 test bike accumulated nearly 1000 street and trail miles through the exertions of several generally abusive riders, and it required only a chain adjustment. At the end of the test, first-kick starting was still the norm; also the XL250 held its state of tune, and other mechanical details, such as clutch actuation, kept on working much better than those of other small-displacement, dual-purpose bikes.

Despite its very noticeable flaw—vibration in street use—the XL175 ranks high on the list of available street/trail motorcycles. It is hardly for dirt demons, but it is dependable and fun. Small four-strokes from other manufacturers are due; and when they arrive, the competition will certainly force Honda to refine its product. Until then, if you're in the market for a small, dual-purpose thumper, the XL175 is the *only* choice—and, happily, an acceptably good one at that. ◉

HELPS QUENCH YOUR THIRST WHILE YOU PLAY

MVP Sports Gum has been specially formulated to help quench your thirst and relieve the 'dry mouth' feeling that happens in sports. Chew it when you're hot and dry, playing or working.

MVP—the real sports gum. It's different and it really works.

Also available: thirst quenching MVP Sports Mints

CIRCLE NO. 40 ON READER SERVICE PAGE.

BLACK MAGIC

Can you expect the same pair of tires to work equally well on all machines of similar weight and power? No. Because there's far more to any tire than being round, black and soft.

By Kevin Cameron

● TIRES ARE THE ONLY KEY LOCKING A vehicle to the earth and allowing control. They provide the thrust to accelerate, brake and steer.

The required thrust comes from friction, and that can only come from reliable, constant contact between tire and road. Air pressure, which acts uniformly in all directions, is the ideal 'spring' to keep a tire tread on the road.

This friction-generating tread is a rubber sheet, wrapped around a donut-shaped, inflated fabric bag called the carcass. Any road irregularities too small to be dealt with by the vehicle suspension are easily accommodated by the light and resilient inflated carcass.

With good contact guaranteed, friction is up to the tread rubber itself, but the friction of such a visco-elastic solid is not easily described. The simple Coulomb friction law says that frictional force is equal to the load multiplied by a number called the friction coefficient. A force of 100 pounds acting on a surface with a coefficient of 0.5 would give 50 pounds of friction force. But there's more tc it.

This law would make friction independent of the areas in contact, for area is missing from this equation. You know that's not right. You can't put a two-inch tire on a 750 and hope to go well. This simple formula must leave out something.

The drive wheel of a powerful machine is resting on the pavement. In its contact patch, the soft tread is indented by each of the thousands of peaks and flows in to fill the thousands of valleys that together make up the rough asphalt surface. The machine is now put into gear and driven away under increasing throttle until the wheel breaks loose and spins. Consider what happens between the rubber and one of these road inequalities or "pips."

At rest, the only deformation is caused by the weight of the machine above, forcing the rubber down over the pip. The softer the rubber compound is, the more perfect will be the fit between rubber and pip, while a harder rubber will bridge right across slight irregularities, not contacting the valleys at all.

As torque is applied to the wheel, the rubber in the contact patch is put into shear. The contact patch remains fixed on the road, unmoving, but the tire carcass turns infinitesimally, as much as the shearing of the tread will allow. In steady running, this shear will make the tire perform more revolutions than the distance traveled would indicate—apparent slip.

At the rubber/road interface, this shear puts more pressure on one side of our pip than on the other, trying to drag the rubber past and over this obstruction. The rubber doesn't slide—yet—because the stress isn't high enough. This is static friction, the fortunate phenomenon that prevents your car, parked on a hill, from creeping slowly down to the bottom. It seems almost certain that some sort of bonds, strong enough to prevent continuous, slow sliding under stress, are formed between rubber and road.

As more and more torque is applied to the wheel, the stretching of the rubber around our pip increases until one of two things happens. If the rubber has low tensile strength, it will tear; and the tread will pour past the pip on both sides, leaving a gouge down the middle. This cutting or abrading action takes force, and so it makes some contribution to traction. If the rubber has higher tensile strength, the strain will build up to a higher value so that any bonds of static friction are broken, and the rubber begins to flow past the obstruction without damage to itself. Since this is an even more energy-consuming process, a great component of traction is generated in this way. This is how tensile strength makes its contribution to grip.

Once the rubber is flowing over the pip, we say that the tire is sliding, producing dynamic rather than static friction. Seen now from the tire's frame of reference, the pip is like a little boat trying valiantly to force its way through a dense sea of visco-elastic rubber. Drag on the boat is now the analog of the traction we want, and we want as much as we can get. Drag is the difference in the forces acting on the front and the back of the body in 'motion,' so we want maximum pressure in front, none behind. The high pressure in front of our pip or 'boat' is supplied by the tensile strength of the rubber, unyielding and refusing to be cut apart. The pressure in the rear would be supplied by the wake as it closes after passage of the 'boat.' A lively, elastic rubber would close up quickly, exerting some pressure on the stern of the boat, reducing its drag. What we want is a dead material, which returns to its old shape only sluggishly. Therefore another traction-generating property is engineered into tread rubber: hysteresis.

Hysteresis is the internal mechanical damping of the rubber, acting to prevent rapid return after deformation. The energy lost in this process appears as heat. The 'wake' of our boat in high-hysteresis rubber will be large, drag will be high, and traction will be powerful. This makes it clear why a small tire won't work on a big machine. Traction depends on the number of these 'pips' in the contact patch, and a big tire covers a larger area of them than a smaller one.

As our accelerating machine applies more and more torque to its tire, the tread slides over the road too quickly for any bonds to form, too quickly for the rubber to conform to its topography. The heat of sliding lowers the tensile strength of the rubber, so the road is abrading it more and more easily. Our horsepower goes up in smoke.

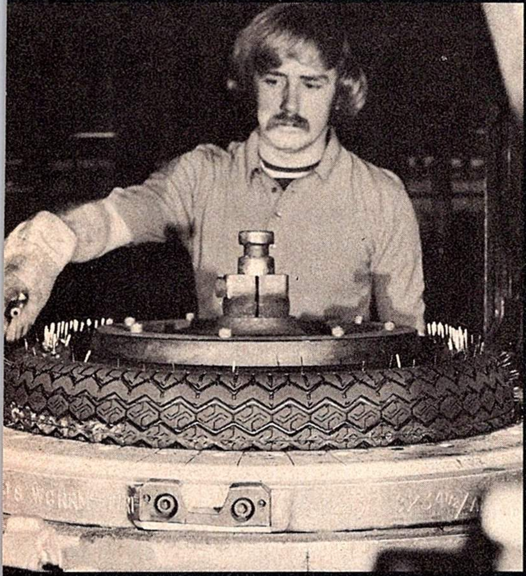
It was once believed that spinning dragster tires melted to form a viscous bond with the track. The tremendous smoky starts of direct-drive dragsters were impressive and the wheelspin enormous,

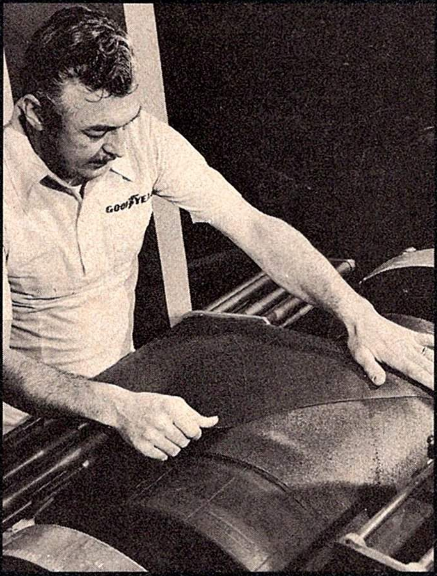
(Continued on page 50)

PHOTO: ROB WYLDER

17 mg "tar," 1.0 mg nicotine av. per cigarette, FTC Report May '78

Warning: The Surgeon General Has Determined
That Cigarette Smoking Is Dangerous to Your Health.





but when slider clutches came in, the smoke and spin went out and the traction went up. There is a best rate of slip for maximum traction, characteristic of each rubber compound, each temperature. Find it and hold it, and you can go well.

What about these vague references to bonds between rubber and road? Experiments with metals have revealed that the area of true contact is far less than one per cent of the apparent area. Even the best-machined surfaces consist of hills and valleys; the areas of contact are only the tips of these hills. This explains the origin of the simple Coulomb law—doubling the pressure doubles the friction. With hard surfaces, doubling the pressure will also double the contact area.

What is happening in those areas of contact? Experiments with clean surfaces in vacuum have shown spontaneous bonding occurs wherever there is no layer of surface contaminants to prevent it. Even with contaminated surfaces, the pressure at the points of contact must be high enough to scrape away some of the contaminants and form molecular bonds. The force required to slide hard surfaces over each other is used to break these bonds. This is friction of solids.

And why don't the two surfaces remain stuck together after the pressure is removed? The points in contact are elastic—they have a spring constant. When the pressure is removed, they spring apart breaking any bonds that have formed.

When a soft material like rubber is pressed onto another surface, the area in true contact increases very rapidly at first, much faster than the Coulomb law would have us believe. The spring constant of the rubber is very low. Once nearly complete contact is established, more pressure can't increase it. This makes the friction coefficient of rubber high at moderate load, only to drop as more and more load is added.

What happens on super-smooth surfaces, such as fire-polished glass, with essentially no surface asperities at all? Unbelievable friction coefficients, as high as 10, are the surprising result! Such friction on the race track would allow cornering at 10 G!

It's interesting to consider what happens when there is no possibility of such surface effects. We know from experience that racing rubber, even when wet with oil or water, can continue to supply surprising traction, simply because the hysteretic component of the friction continues to work quite well.

To sum up, our desired high-traction rubber must have high tensile strength, it must be very soft and conformable, and it must be 'dead' or highly hysteretic.

Rubber itself is a natural spring, consisting of chains of 20,000 or more simple molecules joined end-to-end. These chains are intertwined into a tremendous knot with weak interchain forces acting to resist any 'untying' of the knot. In unvulcanized, uncured rubber, these weak forces are very temperature-dependent. In the cold, uncured rubber congeals into a glass, while summer heat melts it. At moderate temperatures, the interchain forces give the familiar elastic behavior.

This is why Charles Goodyear's first thousand pairs of rubber boots sold well in the spring of 1834 but came back by the hundreds in summer, melted and stinking. His work with rubber led to discovery of vulcanization, a process of forming more reliable interchain bonds. He and others discovered that if sulfur were well worked into the raw rubber and the mixture heated, a permanently elastic material of tremendous usefulness resulted, and an industry was created.

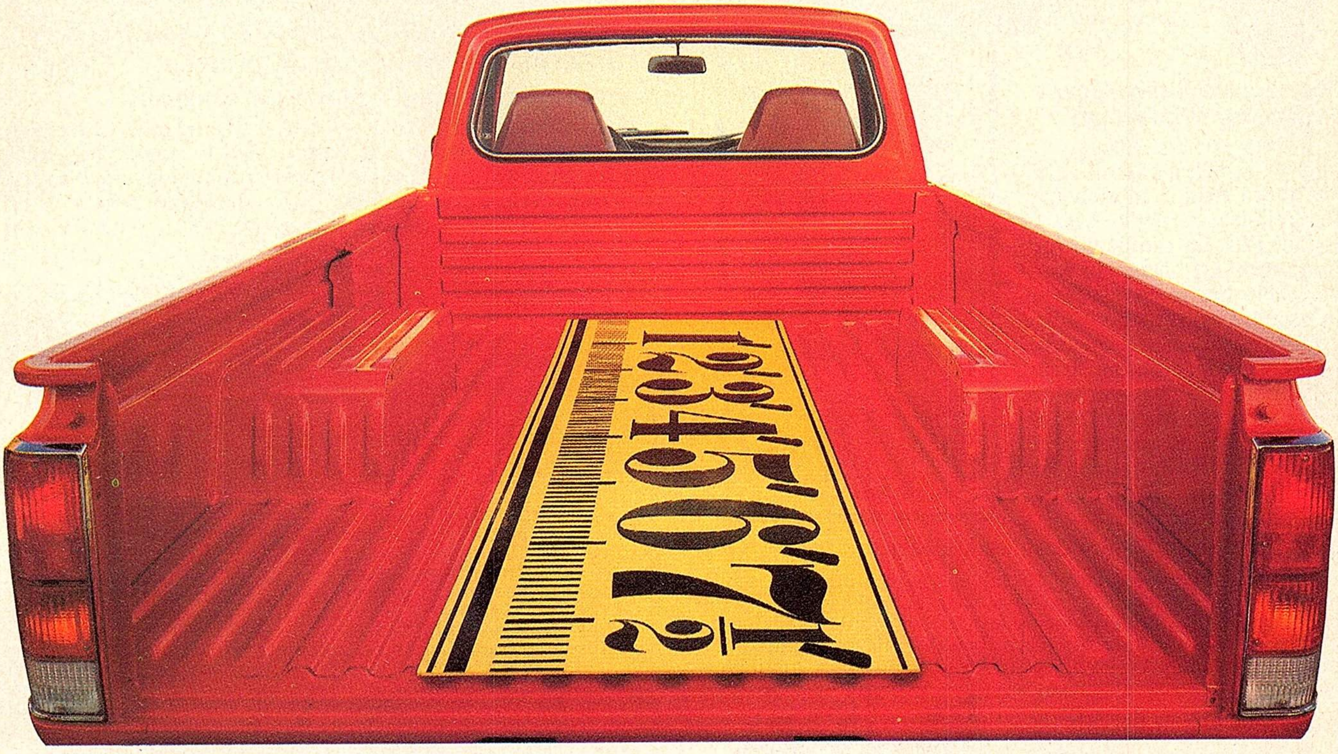
Rubber tires for wagons and carriages had instant popularity, for they both smoothed the ride and saved wear and tear. Pneumatic tires were at first slow to replace solids, but their lower rolling resistance and greater comfort won out.

By our standards, the early tires were narrow and inflated rock-hard. Those compounds couldn't take much flex, and the fabric carcass quickly deteriorated. The fabric was like that in a shirt—interwoven threads at right angles. The crossed threads simply sawed each other apart as the carcass flexed. Before long, fabric with unidirectional fibers only, called cord, displaced woven materials. Now the plies of fabric were applied to the tire in alternating directions, with the layers separated by rubber to prevent chafing. Such cord tires could stand more flex, running at lower pressures, and soon chased the old high-pressure models off the market.

The fiber was "finest long-staple Sea Island cotton," which bonded well to rubber but was weak. Many plies were needed to make strong tires, and such

(Continued on page 89)

CHEVY LUV INTRODUCES THE LONGEST CARGO BOX OF ANY ECONOMY-SIZE PICKUP.



NOW THERE'S MORE TO LUV THAN EVER.

Regular-size LUV with 6-ft. box and available "Mighty Mike" striping.

The available 7½-ft. pickup box —longest of any economy-size pickup in the industry—heads the list of improvements.

1,635-LB. CAPACITY.
With a GVW rating of 4,150 lbs., the long box model can carry payloads of up to 1,635 lbs. including driver, passenger, equipment and cargo. Regular-size LUV with a 6-ft. box is a bona fide half tonner, too. With a GVW rating of 3,550 lbs., it carries payloads of up to 1,125 lbs.

34 MPG HIGHWAY. 24 MPG CITY.
Those impressive figures are EPA estimates with standard 110.8 CID engine and manual transmission. Your mileage will vary depending on how you drive, your truck's condition, where you drive, and your truck's available equipment. California EPA estimates are 30 miles per gallon highway and 22 miles per gallon city.

NEW SOFT-RIDE SUSPENSION.
Series 8 LUV features a new soft suspension on regular-size pickup models. Torsion bar independent front suspension and new four-leaf rear springs contribute to riding smoothness while giving LUV a low road stance.

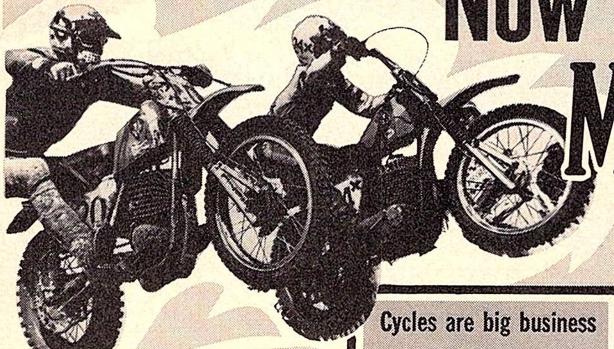
The new LUV is produced for Chevrolet by Isuzu of Japan.

CHEVY TRUCKS

BUILT TO STAY TOUGH.

CIRCLE NO. 42 ON READER SERVICE PAGE.

Now YOU Can Be A MOTORCYCLE MECHANIC...



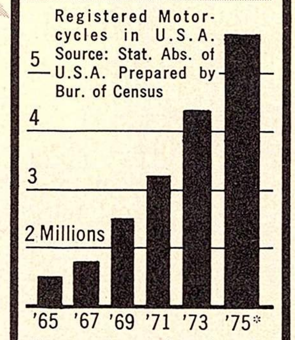
LEARN AT HOME IN SPARE TIME WITH NO PREVIOUS EXPERIENCE

Experts show you what to do, how to do it . . . guide you every step of the way to become a skilled motorcycle mechanic.

Motorcycle Sales Means Profits for Repairmen

Cycles are big business . . . and so is fixing them! There are more than 5 million motorcycles registered in the U.S. today. Plus an estimated million more dirt bikes. No wonder there are so many career opportunities for the skilled repairman. Because opportunities vary in different areas, we cannot promise you a job. But a survey shows that 70.6% of our graduates seeking work, found jobs. Rush coupon for FREE illustrated brochure and full information.

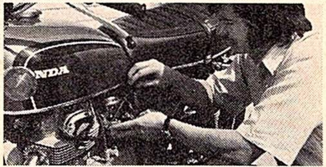
Cycles are big business



Motorcycle registration **increased by nearly 300%** in the ten years from 1965 to 1975. And there were over 5 million cycles registered last year — and they all require maintenance.

If you like to ride a bike for fun . . . learn how to fix it for profit! Can you imagine a better way to earn your living whether you work in a cycle shop for somebody else or start your own cycle repair business. Now, thanks to North American, there's a fast, easy way to get training at home in your spare time. No need to quit school or job. Experts show you step-by-step everything from minor tune-ups to major overhauls.

Work Out of Your Home!



It's easy to get started once you qualify as a motorcycle mechanic. Just let your friends and neighbors know you're ready to repair cycles in spare time — or if you'd rather, get a full time job at a motorcycle shop or dealer.

You Get the Tools You Need for a Fast Start

We send you the special cycle tools and test instruments you need. This set of precision tools is yours to use during your training . . . and yours to **keep** in your action-packed career. You actually learn by doing — with the tools in your hands — getting the practice you need to become an expert motorcycle mechanic.

Everything is explained in easy-to-understand language, complete with drawings, diagrams and photographs. You'll learn engine design, carburetion, electrical systems . . . as well as how to adjust and repair frame, wheels, shocks, transmission, valves, everything you want to know from routine maintenance to a major overhaul.

Motorcycle Shops Employ Qualified Mechanics

Has your bike ever been out of action waiting for needed repairs? Some shops don't always have enough mechanics on hand to take care of everyone as fast as they would like. Opportunities vary from place to place, but the sale of hundreds of thousands of motorcycles a year in the U.S. insures a continuing need for motorcycle maintenance.

Thousands of New Cyclists

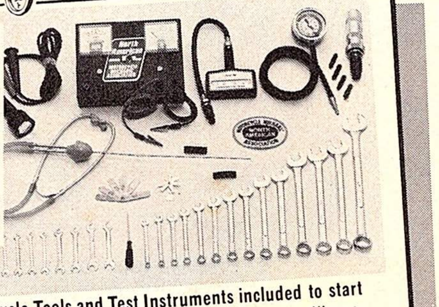
The number of motorcycles registered in the United States has increased every year since 1965. And now with higher gasoline prices you can see that the incentive to switch from automobiles to motorcycles for regular transportation is greater than ever before . . . not to mention the thousands of new dirt bike riders who are discovering the thrill of this action-packed sport.

More Girls — More Bikes Each Year

If you've been riding your bike for fun the past few years, you can see for yourself that more and more girls are taking up the sport. And this means more bikes every year . . . and more bikes mean more motorcycle repairs. So get in on the action . . . get in on the fun — start making money as a motorcycle mechanic. Rush the coupon today for free facts — full information.

You'll Be the Center of Attraction in Your Circle of Friends . . .

Enjoy the admiration of friends and neighbors as they flock around to watch you tear down and tune up all kinds of motorcycles. And just think of the satisfaction in knowing you've got the best performing bike in town. Plus, you can make extra dollars fixing motorcycles for friends and neighbors.



Special Cycle Tools and Test Instruments included to start you fast! These fine tools plus your North American "know-how" help you become a skilled mechanic. We teach you how to use wrenches, sockets, impact screwdrivers, timing lights, electrical test instruments, compression gauges, vacuum gauges, degree wheels, soldering irons, ignition wrench sets, dial indicators and much, much more! We even include a set of special cycle tools and instruments to get you started **fast!** These are yours to use during your training . . . and yours to **keep** in your action-packed career as a motorcycle mechanic. Find out all about it now. Send for FREE color brochure — full information. No cost or obligation . . . now or ever! Rush coupon today.

Start Your Own Cycle Repair Business

Your future as a motorcycle mechanic is in your own hands. You can decide for yourself whether you want to work for someone else or get into your own cycle repair business. Start in your spare time repairing cycles for friends and neighbors — or get a job with a motorcycle shop! After you've been a working mechanic, you can decide whether you want to start your own motorcycle repair business.

SEND FOR FREE INFORMATION

Get all the facts now . . .
without obligation.
No salesman will call.

T09

MAKE MONEY IN MOTOR CYCLE REPAIR

MAIL POSTAGE-PAID CARD FOR FREE INFORMATION

NO SALESMAN WILL CALL . . .

NORTH AMERICAN SCHOOL OF MOTORCYCLE REPAIR,
4500 Campus Dr., Dept EA088. Newport Beach. CA 92663

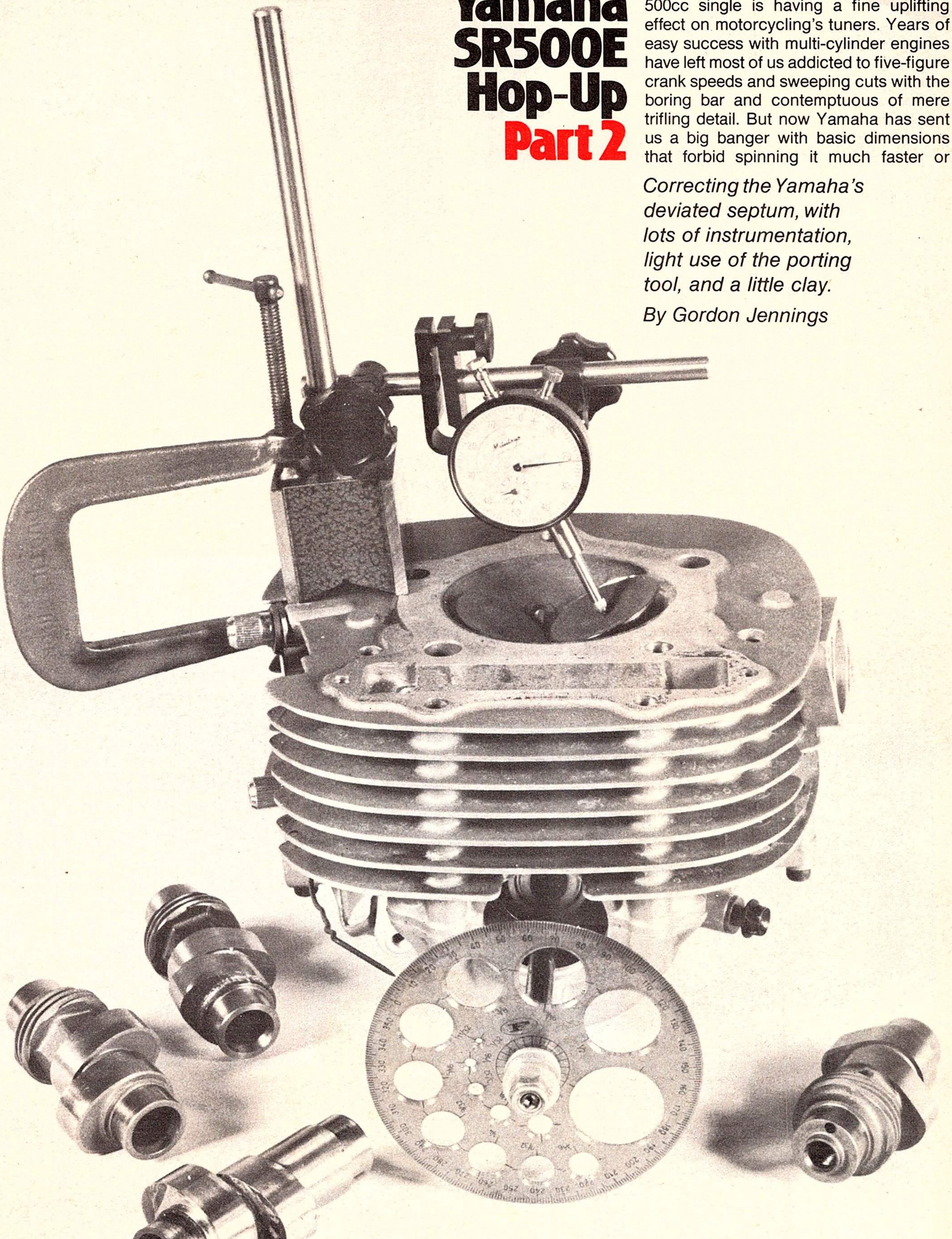
PHOTOGRAPHY: DAVE HAWKINS

Yamaha SR500E Hop-Up
Part 2

● YAMAHA'S RESURRECTION OF THE CLASSIC 500cc single is having a fine uplifting effect on motorcycling's tuners. Years of easy success with multi-cylinder engines have left most of us addicted to five-figure crank speeds and sweeping cuts with the boring bar and contemptuous of mere trifling detail. But now Yamaha has sent us a big banger with basic dimensions that forbid spinning it much faster or

Correcting the Yamaha's deviated septum, with lots of instrumentation, light use of the porting tool, and a little clay.

By Gordon Jennings

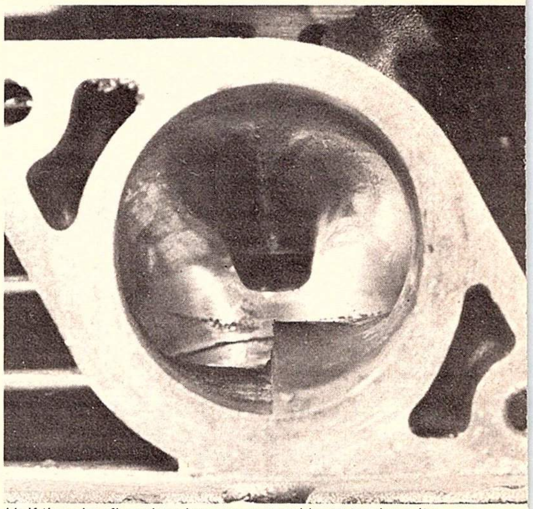


making its cylinder volume appreciably greater, and we are at last obliged to turn our attentions back to a purer if more difficult form of the tuner's art. Examples of earlier bangers assure us the Yamaha SR/XT/TT500 can be made to deliver more than its present mid-twenties horsepower; recent experience warns us that the delivery is going to be a breech presentation all the way.

There was nothing in the results of *Cycle*'s dynamometer testing with an SR500 to encourage faith in the bolt-on approach to improved performance. We tried oversize carburetors and got exactly nowhere, though removing the stock air box and filter did give us a gain of about 2.6 horsepower. Carburetor size did begin to make a slight difference after we had uncorked the engine's exhaust system by removing its muffler; a 36-millimeter Mikuni gave a clear (though still small) gain over the stock-carburetor output after we'd clamped a short megaphone in place on the exhaust pipe. In this configuration our SR500 produced almost 34 bhp at 7000 rpm and had solid above-stock power from about 4300 rpm to the 7500 rpm which we felt was the engine's disaster threshold. Our final bolt-on (bolt-*in,* actually) was a Megacycle #5120 camshaft, which inspired the Yamaha to pump out nearly 38 bhp, but the peaking speed rose to a worrisome 7500 rpm and the engine gave decidedly limp performance below 6000 rpm.

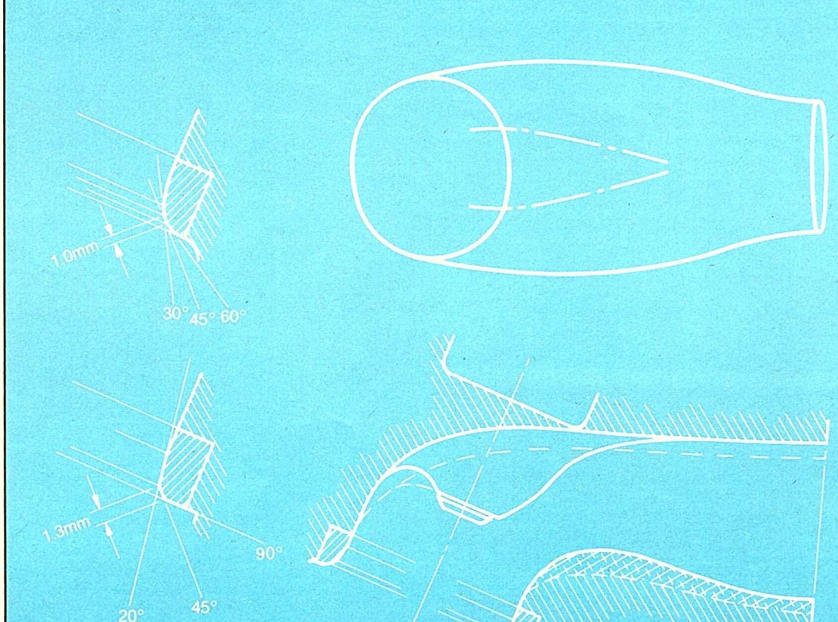
Everything we learned from our dyno testing tended to validate the widely held belief that the Yamaha banger's big problem is an inability to breathe properly. Though we had expected this, we were reluctant to grab the nearest porting tool and start carving away, until we'd collected some hard baseline information. Also, truth to tell, we didn't know enough about the specifics of port shaping to feel especially optimistic about our chances of improving on Yamaha's efforts. Experience has brought us a modesty with respect to our own competence in these matters, and as a rule we are more than willing to leave porting work in the capable hands of experts like Jerry Branch and C. R. Axtell.

Jerry would have given our SR500 cylinder head the full Branch Flowmetrics treatment, returning it ported and polished to within an inch of its life, if that had been what we wanted. But having Jerry do the work would have taught us (and, by extension, you) almost nothing beyond the fact that he knows his business . . . which we already knew. What we wanted, and requested, was the use of Jerry's air flow test bench. And we got it, along with the kind of bemused smile an indulgent uncle might give a somewhat retarded nephew who had just asked for a chemistry set. The reason for Branch's smile was to become all too apparent in the days that followed as we daubed and molded clay, shaved away metal, and reeled with the surprising discoveries made in the course of fumbling through dozens of modifications and some 600 flow measurements. Small changes we had supposed would hasten the movement of air through the intake port often proved to hinder it; our laborious trial-and-error reshaping of the whole port eventually produced a passageway quite unlike the one we had anticipated.



Half the clay floor has been removed here to show its 7mm depth; the port has been raised and widened.

Shown here is the modified SR500 intake port, with dotted lines to indicate the original. Yamaha's valve seat is wide and surrounded by sharp edges and abrupt angles. We narrowed the seating area, rounded the seat throat, made the angles less abrupt—and lost flow volume. Only the carving of a channel around the seat helped.



There's nothing especially tricky in the essentials of flow testing. Branch's test bench uses a high-volume, variable-speed centrifugal pump to draw air through the port (or whatever) being tested, and you use fluid-level gauges to control and measure your work. You crank up the blower speed until a vertical sight-glass registers a receiver vacuum equal to some standard number of inches of water, and then you take the bulk flow reading from the fluid level inside another nearly-horizontal glass tube. Apart from performing a couple of mildly tedious computations to convert the sight-glass readings into cubic-feet-per-minute flow rates and correcting the results to standard atmosphere, that's all there is to the job. We used a "12-inches-of-water" vacuum simply because that's what Jerry uses; following the same procedure would yield numbers directly comparable to those taken with other cylinder heads. The latter are recorded on sheets tucked away in the Branch Flowmetrics files, and this information would provide a basis for judging the SR500's air flow capacity and our own progress . . . if any.

Flow test work begins to gather complexity when you try to make it relate to conditions in a running engine. One essential step in accomplishing this is to take flow readings over a whole range of valve-open positions. An engine does not run without its intake valve, and the valve is at full lift for only a small fraction of its nominal open period. Thus, most of the cylinder-filling air flow occurs with the valve somewhere between its seated and fully open positions, and that reality must be reflected in the test procedure. Jerry fits the valve with a light closing spring and rigs a screw jack above the stem, which enables him to crank in precise amounts of lift. He takes flow readings at lift increments of .050-inch.

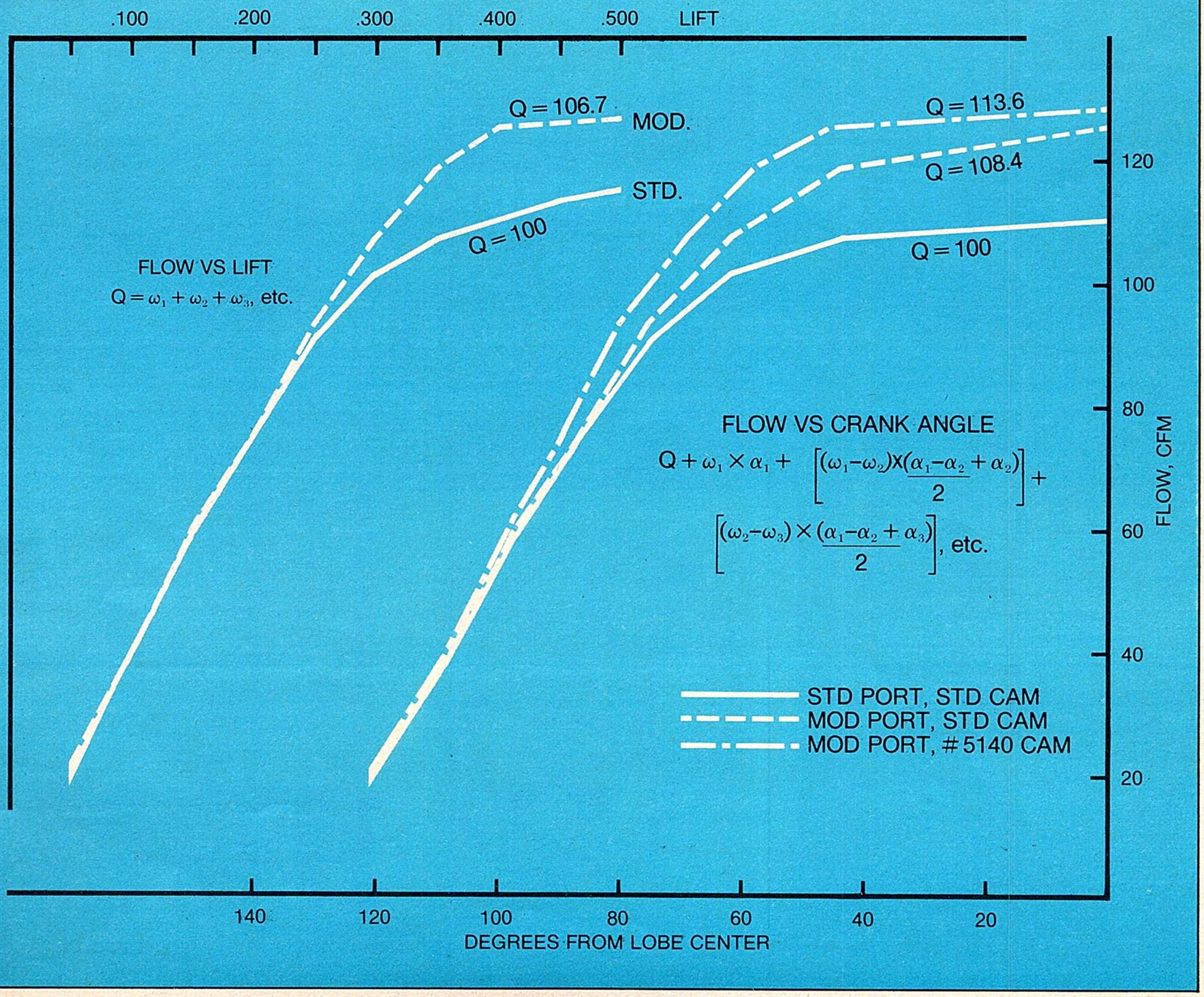
Flow testing also has to take into consideration the major characteristics of the cam lobe profile that moves the valve. The most obvious of these is maximum valve lift: there's no point in fretting about air flow at valve openings the cam doesn't provide. Another, more subtle factor is the rate at which the cam opens and closes the valve. Some cam profiles move valves very rapidly, keeping them near full lift through more of their total open period than other cams with a gentler action. When an abrupt cam is used, flow at small valve openings is less important than what happens at full lift; with slower opening and closing rates, flow at the lower lifts assumes a greater importance.

At the time our flow testing and port shaping was being done, the matter of cam selection had not been settled. Indeed, one of the most important reasons for going to the flow bench was to obtain data that would make a rational choice possible. We knew the stock Yamaha SR500 cam, working rockers that amplify lobe height by about 1.42 at the valve, gave an intake lift of .400-inch. We knew, too, that some of the accessory cams available provide lifts of slightly more than .500-inch. Our SR500 had not shown any conspicuous liking for the .469-inch-lift Megacycle #5120 cam we tried during our first series of dyno tests, but no conclusion could be drawn from that experience because the accessory cam's timings also differed from the stock specifications. So we had incomplete and inconclusive information, and we had little confidence in grapevine assurances that the Yamaha single "likes" lots of valve lift. There was nothing to do but try to increase flow out to .500-inch intake valve lift; that was the absolute maximum we could conceive of using. To cover all bases, we decided to check the flow to .600-inch lift in case there was reason to try for more lift than the amount we considered convenient and prudent.

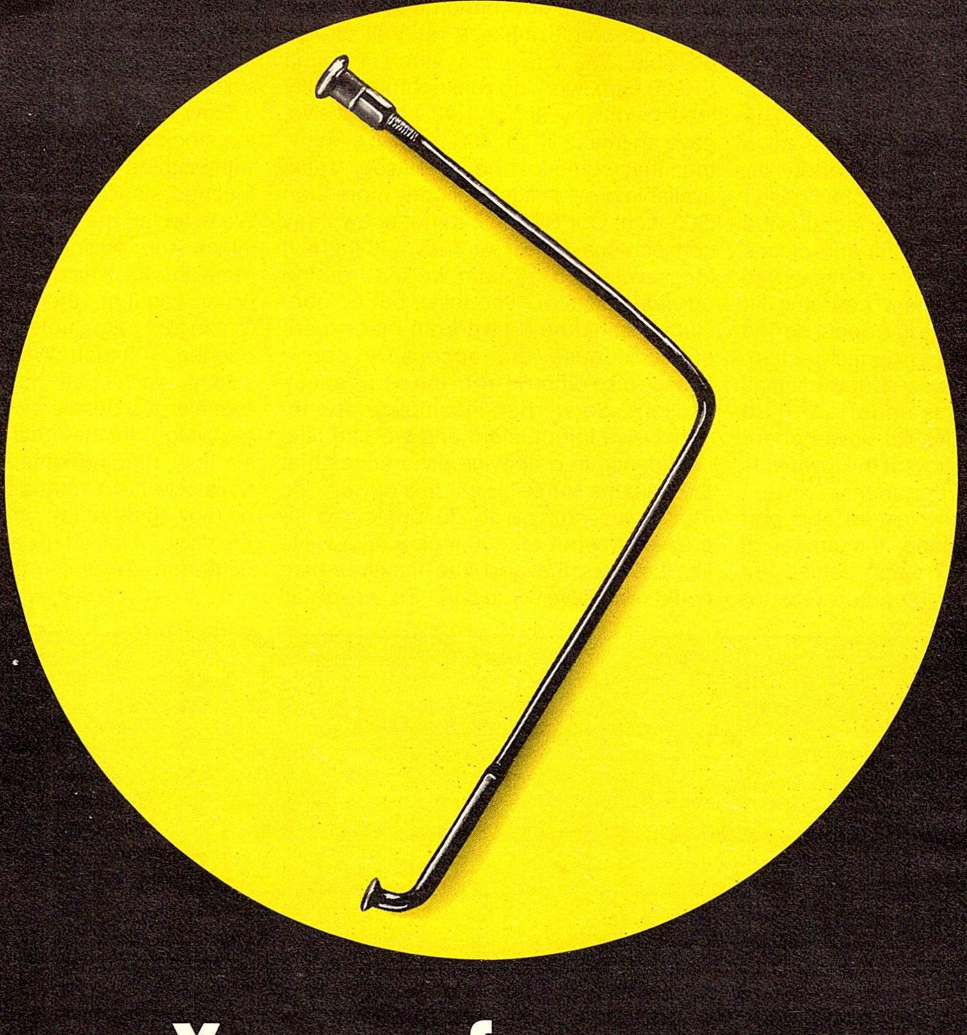
Flow test number-one was made with the stock 34mm carburetor in place and with nothing in the port or on the valve touched since leaving the Webco dyno. We even left the valve's baked-on oil film intact. And, pulling air through the complete intake tract with a 12-inches-of-water vacuum, there was a 110 CFM (cubic feet per minute) flow with the valve opened .400-inch. Was that good? Jerry said it wasn't: he has a rule-of-thumb formula (the details of which he declines to divulge) for determining engines' bulk air flow requirements, and his calculations said the Yamaha intake port should be moving air at the rate of 132 CFM with the valve at full-lift for maximum power at 6500 rpm. Assuming that Jerry's formula

(Continued on page 59)

Assessing flow gains: Maximum readings don't count; it's the areas under the flow curves you want, and plotting flow vs. crank angle provides a more accurate view of what has been accomplished. An overall flow value, "Q," for the flow vs. lift curves may be arrived at by simply adding flow numbers. (Flow at .050 plus flow at .100 plus flow at .150, etc.) Using this method, Q for the modified port is 6.7 per cent better than stock up to .400-inch lift. But valve movements in a running engine include a long period spent very near maximum lift, as may be seen in the flow vs. crank angle curves. Using a more lengthy equation to determine areas under the flow/angle curves, the Q value for the modified port emerges as 8.4 per cent better than stock; and when the whole curve is shifted upward to reflect the higher lifts of a Megacycle #5140 cam, the value for Q rises to become 13.6 per cent above standard.



MEMBER
MIA



Your performance is only as good as your weakest link.

Lester wheels are built with performance in mind — they don't break!

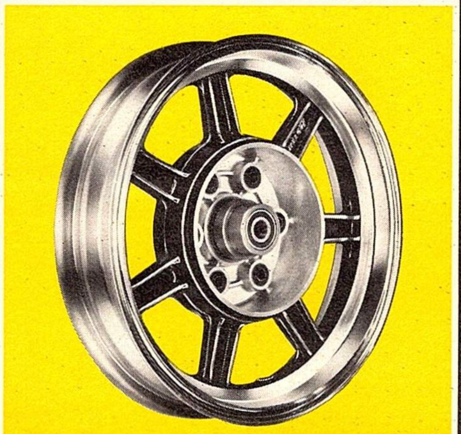
No matter what kind of biking you do. Or where you do it. Thanks to the superior strength of I-beam construction (the same kind used in skyscrapers).

There's nothing to come loose. Or unbalanced. Which means no spokes to tighten. Nothing to balance. Ever. (Except your tires.)

And try bending them. It's practically impossible. So there's nothing to straighten. Or replace. (We test our wheels against military aircraft specifications, the world's toughest.)

They don't add weight, either.

In fact, Lester wheels are pounds lighter than spoke wheels because of cast alloy aluminum construction. (And you can use tubeless tires.)



Which means less unsprung weight for superior handling, braking and acceleration under the most severe stress conditions.

In other words, PERFORMANCE.

But the real beauty of our mags is their real beauty.

And they stay that way thanks to a super-tough, polyurethane-coated finish.

In other words, LOOKS.

In other words, Lester!

Lester makes the best wheel.

Retail prices start at $137.50 — so why wait — phone or write today.

LESTER CAST ALLOY WHEELS

26881 Cannon Road, Bedford Heights, Ohio 44146 (216) 439-7200

CIRCLE NO. 44 ON READER SERVICE PAGE.

SR500E Hop-Up . . . *Continued from page 57*

was valid—and he swears it has proven accurate in predicting the air appetites of a large sampling of engines—we had a starting point representing just 83 per cent of the optimum.

Our prospects of pulling big horsepower out of the SR500 with increased valve lift began to look dim when we plotted flow readings from .050- to .600-inch lifts on graph paper. The lift/flow line was essentially straight only to .250-inch, where the flow reached 91 CFM; from there it began to flatten, giving ever smaller increases with each .050-inch movement of the valve away from its seat. Flow at .500 lift was just five CFM better than down at the .400 opening, and pushing the valve .600-inch away from its seat brought it to only 118.4 CFM—a rate still well below the projected requirement. So sheer valve lift could not be expected to take care of the air-flow problem, and our single experiment with a longer-duration cam indicated that cylinder filling obtained in that fashion resulted in an unacceptably narrowed power range.

A larger intake valve might have seemed attractive if we had found a straight-line relationship between valve lift and air flow. But, as noted, the lift/flow gains began to diminish above .250-inch lift. This strongly suggested that the limiting factor was the port shape itself, although we had to consider the possibility that the stock 34mm carburetor was imposing an upper flow limit. Tests made with other carburetors did much to discredit this last notion: we tried a 36mm Mikuni, a 36mm Dell'Orto and a "38mm" (36mm throat) EI carburetor and found only slight gains in flow. The difference was in the order of 3.5 CFM at .400-inch lift, non-existent below .200-inch lift, and negligible among the three carbs tested.

One of the things that has always stirred our curiosity is the efficacy or lack of same of a "racing valve job." Yamaha's shop manual specifies a seating-ring width of 1.2mm, noting the seat should be trimmed with cutters to make contact right in the middle of the valve's 45-degree seating face. The manual also recommends trimming the lower valve seat face with a flat cutter, making a surface 90-degrees from the plane of the valve stem and using a 60-degree cutter to open the valve seat throat. Well, we knew better than that and went to work: we cut into the seat with a 46-degree tool to give ourselves working room, then put a small 120-degree (included-angle) bevel on the downstream side of the seating area, and finished by making a 60-degree valve throat cut deep enough to leave us a one-millimeter seating ring out at the edge of the valve head. The valve itself was cleaned up, all the baked-on oil scrubbed away, and some nasty ridges removed by chucking it up in a drill press and spinning it against files, stones and emery cloth.

(Continued on page 60)

PHANTOM RIDER

SAVE MONEY!

SUPER DISCOUNTS ON FAMOUS BRAND

TIRES & ACCESSORIES

CHECK OUR UNBELIEVABLY LOW PRICES, THEN ORDER BY PHONE:

call TOLL-FREE **1-800-854-3103** TODAY! In Calif. 1-714-556-RIDE.

● BAC/VISA/M-Charge/Am-Exp credit card orders shipped same day.

CONTINENTAL K112 (R) & RB2 (F)

The best high-performance and high mileage tire! * Indicates tubeless.

450H-17	K112	**$46.13**	510/80H-18	K112	**$45.19**
325H-18	RB2	**$33.14**	*510/80H-18	K112	**$53.18**
350H-18	K112	**$38.04**	325H-19	RB2	**$36.05**
400H-18	K112	**$43.52**	350H-19	RB2	**$38.59**
425/85H-18	K112	**$44.48**	*350H-19	RB2	**$43.75**
*425/85H-18	K112	**$51.99**			

DUNLOP K91 MK II

Belted for high-speed performance and increased mileage. Use with or w/o tubes.

510H-17	**$52.30**
425/85VB-18	**$45.93**
510H-18	**$49.33**
410V-19 RIB	**$39.62**

DUNLOP K81 Low profile front or rear tire.

510H-16 MK II	**$38.16**	510H-18	MK II	**$39.68**
450H-17A (K87 MK II)	**$30.78**	325H-19	F6 RIB	**$29.39**
360H-18	**$29.40**	350H-19	F6 RIB	**$29.34**
410H-18	**$34.35**	360H-19		**$31.22**
425/85H-18	**$36.97**	410H-19		**$34.91**

DUNLOP SPORTS SENIOR/K88

Low sidewall blocks for extreme cornering. Self-cleaning.

510-17	K88	**$28.74**	500-18	K88	**$33.60**
410-18	SSR	**$22.46**	300-21	SSR	**$22.57**
460-18	SSR	**$26.28**	325-21	K88	**$27.64**

CHENG SHIN STREET

K81 pattern, low profile and hi-speed rated — a super buy!

510-16	**$28.88**
510/85H-17	**$29.87**
410/85H-18	**$25.49**
460/85H-18	**$28.34**
510/85H-18	**$32.55**
325/360-19 RIB	**$15.79**
360/85S-19	**$17.29**

VISIT OUR CATALOG SHOWROOM

CHENG SHIN MOTOCROSS

Super Digger copy. Top quality at lowest prices.

385-14	**$15.43**
410-18	**$20.79**
460-18	**$24.68**
530-18	**$31.89**
300-21	**$17.82**

IMPORTANT: Tire prices include Fed. Exc. Tax. If you compare prices, be sure freight, F.E.T. and sales tax are incl. in total price quoted. Prices in previous ads no longer valid.

(c) Phantom Rider 1978.

TUBES — All sizes: Ch. Shin **$3.98.** Michelin **$4.98.** Goodyear **$6.49.** Continental **$8.96.** Special with tire purchase: Ch. Shin **$3.25.** Goodyear **$5.75.**

GOODYEAR EAGLE A/T & G/T

Low profile, blackwall, street/touring tires.

510-16	A/T	**$39.98**	450-18	G/T II	**$43.50**
510-17	G/T II	**$47.01**	325-19	A/T	**$28.62**
400-18	A/T	**$34.86**	350-19	G/T II RIB	**$33.72**
450-18	A/T	**$37.81**			

A/T also available with Raised White Letters — tube-type or tubeless.

SHOCKS & SPRINGS

— SAVE UP TO 35%!

MULHOLLAND rebuildable street and MX shocks — all lengths **$38.95/pr.** Springs: sgle rate **$9.75/pr. $10.95/pr.**

MULHOLLAND LTG: LONG TRAVEL GAS SHOCKS — all lengths **$69.50/pr.** Springs: sgle rate **$17.50/pr.** Progr. **$23.95/pr.**

H-P EXHAUST SYSTEMS Increases performance 8-20%.

Hooker	Type	Price (chromed)
Hon CB/CL350 68-73	2 into 1	**$82.73**
Hon CB750 thru 76	4 into 1	**$121.57**
Kaw Z1, KZ900, all	4 into 1	**$121.57**
Suz GS750 77-78	4 into 1	**$140.14**
Yam XS1/2/650, all	2 into 1	**$82.73**
Yam XS750, all	3 into 1	**$122.43**

Bassani	Type	Price (black)
Hon XR75 73-78	up or dn	**$40.07**
Hon CR250 thru '75	down	**$63.75**
Kaw KZ650, all	4 into 1	**$136.00**
Kaw H2 750, '74-'76	3 into 3	**$182.75**
Suz GS550, 77-78	4 into 1	**$136.00**
Suz GT380/550/750 74-77	3 into 3	**$182.75**
Yam 250/350/400, all	twin	**$135.10**

Partial listing only. Kerker and Jardine exhausts also available.

LOCKHART OIL COOLERS

Honda Fours/GL 1000/Kaw 650/900/1000/Suz GS750/-Yam XS650/750 blk **$64.98.** chr. **$84.98** H-D Sports/-Nor/Tri blk **$58.98.** chr. **$78.98.** New: 700SS kits — 50% increased cooling — Honda Fours, Kaw 900/-1000. H-D Sports. Blk only **$86.98.** New! Thermostat valve — works with all coolers — **$26.00.**

LESTER MAG WHEELS

The unique cast alloy wheel system that accepts tubeless tires for less weight and improved handling. For BMW, H-D, Kaw, Suz. Front, from **$124.00.** Rear — from **$158.00.** Hi-lighted $18 extra per wheel. FREIGHT INCLUDED. For details, call us **toll-free 1-800-854-3103.**

Call or send for FREE CATALOG. **1-800-854-3103**

RIDER WEAR

BELL HELMETS *Save up to 12%*

R-T (road/trail)	wht (std), red, blu, ora	**$47.25**
Magnum II	sil (std), wht, ora	**$69.75**
Star II	wht (std), ora	**$87.70**
Star 120	wht (std), ora	**$79.90**
Moto Star	wht (std), yel	**$78.85**

Sizes: 6⅜-7⅞ Shoei helmets also available.

NYLON MX PANTS

Made of strong nylon, these pants offer maximum protection with plastic knee cups (removable) and thick padding at hips. Reinforced seat. In black, red, or blue with contrasting stripe. Specify size: 22-38 **$38.65.**

MUSTANG TOURING BOOTS

Unbelievably comfortable and light (only 3 lbs/pr). In genuine black leather, 13¾" tall, ¾" hard-wearing rubber sole w/steel shank, zippered back. Scuff pads on toe caps. In full sizes from 5 thru 13. **$59.95/pr.**

BELSTAFF TOURING JACKET

100% WATERPROOF, this comfortable and stylish jacket is made of heavy-duty polyurethane-proofed nylon with all seams sewn, solutioned and taped. Has a red, quilted lining and four pouched front pockets. Color: Black. Sizes: S (34"-36"), M (38"-40"), L (42"-44") **$79.95.**

MATCHING PANTS: 27", 29", 31", 33" inseam **$59.95.**

PHANTOM RIDER 3001 REDHILL AVE. COSTA MESA. CA 92626

SHIPPING CHARGES

must be added to all prices.

Minimum order is $10.00.	West of Rockies	Mid-West	East of Miss.
Front tires	2.00	2.85	3.35
Rear tires	2.85	4.15	4.95
Shocks, springs	2.25	3.25	3.75
Exhausts	3.60	5.25	6.75
Boots	2.00	2.85	3.35
Helmets/jackets /pants	1.50	1.85	2.25

AK, HI, PR, CZ, APO/FPO customers, use 3rd col. Freight rates to Canada, add $3 to amounts shown in 3rd col. All orders shipped fully insured. For COD orders, add $1.25 COD fee to freight charges. No CODs to APO/FPO or Canada addresses.

PHANTOM RIDER ● **3001 REDHILL AVE.**, BIN 101, **COSTA MESA, CA 92626**

Qty	Size	Description	Price ea.	Total
			Add shipping charges	
			Calif. res. add 6% sales tax.	
			TOTAL	

I enclose:
☐ Mo. Order ☐ Cert. Check ☐ Pers. Check (allow 2 wks. to clear)
☐ 25% deposit — will pay balance, plus freight C.O.D.
Charge to: ☐ Visa/BankAm ☐ M/Charge ☐ Am. Express
☐ Please send me your FREE catalog.

Account No. ____________ Exp. date ______
Bike: year, make, model ____________
Name ____________ 9
Address ____________
City/State/Zip ____________
Your phone no. (day time) (   ) ____________

call TOLL-FREE **1-800-854-3103** CALL TOLL FREE

DEALERS' INQUIRIES INVITED

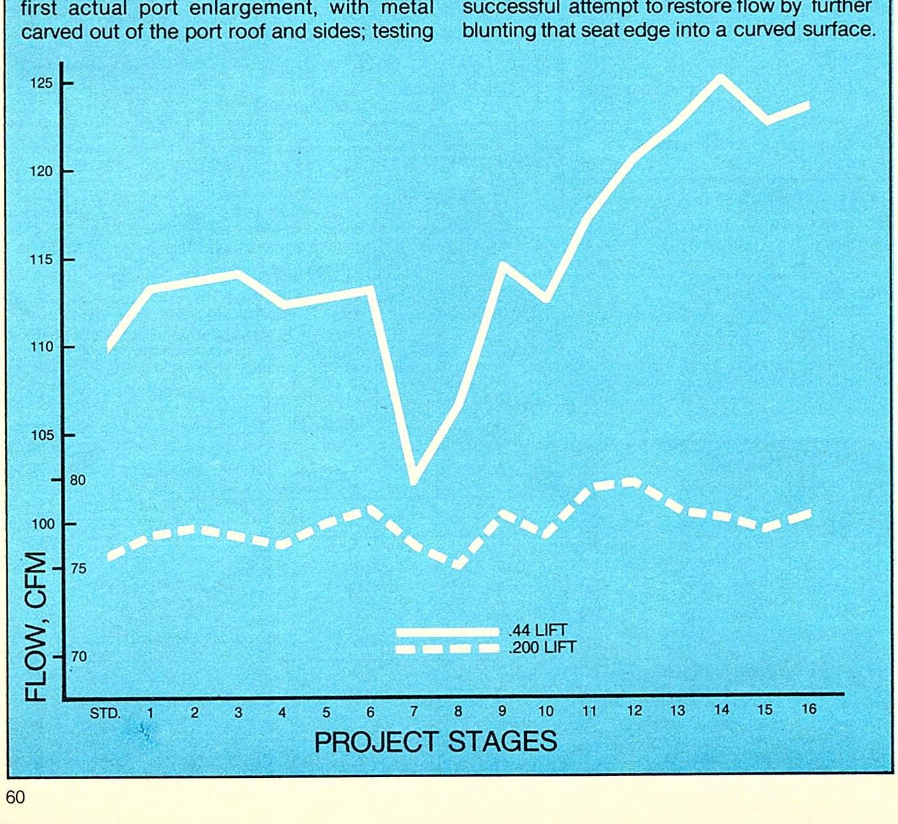
SR500E Hop-Up

The finished job was a pleasure to behold, dazzling to the eye and a satisfaction to the tuner's soul. But it wasn't effective.

The reader will appreciate that after years of preparing racing engines in precisely the above fashion, after buying a very expensive set of adjustable cutters and laboring long into many nights to achieve precisely the seating-area shape applied to the SR500, we were totally convinced of the rightness of this ritual. We *knew* it would help ease air past the intake valve, especially at the lower lifts. And we were jubilant to find a one-CFM improvement with the SR500's intake valve cracked open .050-inch. Wonderful, we thought, screwing the lift to .100 . . . where it proved to be slightly worse. All the subsequent checks at higher lifts brought ever-worsening news: our fancy racing valve job had depressed the flow rates at all points above .050-inch and put us 3.5 per cent behind scratch at .400-inch lift. It was not a propitious beginning, and the worst of it was that we couldn't get back to a stock valve-seat configuration. The metal was gone and could not be uncut.

Our reworking of the SR500's intake port was (fortunately, in all probability) tightly circumscribed by a combination of solidly supported theory and the existing metal in the cylinder head. A major enlargement of the intake port diameter was almost impossible, as Yamaha's casting techniques are quite good and do not surround the various cylinder head cavities with excessively thick walls. In any case that approach to flow improvement would have been a mistake. Large-diameter intake ports will yield big numbers on a flow bench, but those who have let themselves be seduced by steady-state testing's promises will find disappointment in the dynamometer room. Only the inertia of high-velocity air keeps the flow going the right way through an engine's intake tract during the late part of the valve-open period, after the actual intake stroke has been completed and the piston is on its way back up toward top center. All present-day engine designers recognize the importance of maintaining high intake air velocities, and they disagree only on the speed at which frictional losses within the port offset the gains from the "ram-charging" effect.

Change wasn't all progress: This chart shows how 16 major modifications, plotted in chronological order, influenced flow rates at .200- and .400-inch valve openings. ***Stage-one*** gives flows for the stock port, with the stock carburetor and manifold removed and a Branch 36mm Mikuni kit installed. For ***stage-two,*** an El 38/36mm carburetor was substituted for the Mikuni. An Axtell 36mm Dell'Orto was fitted for the ***stage-three*** test. ***Stage-four*** combines the 36mm Mikuni with a "racing" valve job which depressed the flow. A longer port floor/valve seat radius was molded in clay for ***stage-five*** and tested with 36mm Mikuni in place. Clay added on the port floor gave it an up-draft angle, and ***stage-six*** shows the result of angling the manifold to suit the new port centerline. For ***stage-seven*** we reversed ourselves, using clay to make the port flatter instead of more arched, with results that eliminated further consideration of the flat-port approach. ***Stage-eight*** was the first actual port enlargement, with metal carved out of the port roof and sides; testing was done without claying over the port floor, and flow was below that for the unmodified port. For ***stage-nine*** the clay floor arch was added, and a large flow improvement obtained. ***Stage-ten*** entailed molding a nicely rounded port throat in clay, which looked right and tested wrong. At ***stage-eleven*** all the clay was shifted to the port floor, for a "D" shape and a big gain. ***Stage-twelve*** was where we arrived by following the D-port concept further, cutting metal and adding clay. ***Stage-thirteen*** was where we raised the port entry just three millimeters with encouraging results. Progress stalled, then, until we arrived at ***stage-fourteen***—replacing the 36mm Mikuni with one having a 38mm throttle bore; the bigger carburetor gave virtually no improvement when tried earlier. ***Stage-fifteen*** wasn't supposed to be a major change: we just blunted a sharp edge in the valve seat throat and were appalled at the drop in flow. Fifteen led to ***stage-sixteen,*** an only partially successful attempt to restore flow by further blunting that seat edge into a curved surface.



Intake port air velocity will vary greatly during the valve-open period, and the velocity is exceedingly difficult to measure. But a "mean" velocity is easily calculated (you divide intake cross-sectional area by the cylinder bore area and multiply the result by piston speed) and is widely used in establishing appropriate valve and port diameters. The SR500's intake port has a manifold-face diameter of 35mm, from which we calculated mean intake air velocities of about 270 and 380 feet per second at 5000 and 7000 rpm respectively. Those values are, if anything, low for a modern racing engine; they are a trifle high for an intake port with a shape that owes much to convenience in carb location and as-cast interior walls.

We noodled with the numbers, considered making the Yamaha's port a millimeter smaller by slathering in some epoxy, fretted over imponderables, giving fleeting thought to opening the port a little (an option rejected on grounds it was sure to narrow the powerband unacceptably) and in the end decided to stay with the stock intake diameter. The 35mm size gave calculated air speeds well within the appropriate range established by ram-charging theory; it also was one selected by Yamaha's engineers, who presumably did not fix upon that size just as a whim. We did not plan to shift the SR500's peaking speed upward by more than a few hundred revs, at most, and therefore had no reason to conclude that bigger would be better.

Those who think of port modifications only in terms of removing metal may be surprised to learn that all our early flow-bench experiments were made solely by filling areas of the SR500's intake port with modeling clay. More surprising was that the highest flow reading seen in all the days of changes and testing came when we simply jammed a stick into the port and waggled it around until we found a position that was right. That reading was 131 CFM at .400-inch lift, with an absolutely stock port and a 36mm Mikuni carburetor. This astonishing improvement never was equalled by anything else we did. We'd have glued the stick in place

(Continued on page 100)

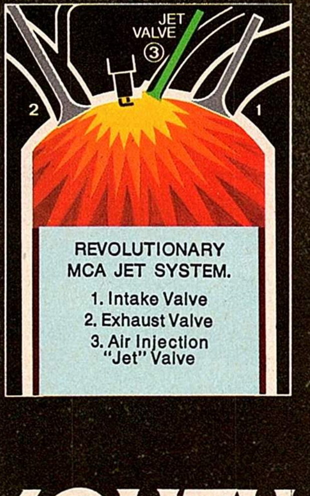
DIFFERENT STRIPES AND STROKES FOR DIFFERENT TYPES OF FOLKS.

Don Prudhomme races funny cars . . . just about as fast as anyone has ever raced funny cars.

Prudhomme chose to build his funny car from a Plymouth Arrow, because of its aerodynamic properties. He has created an unbelievable performance car. And the Arrow you'll find at your Chrysler-Plymouth dealer is quite a performance car, too.

The 1978 Arrow GT features hemispherical combustion chambers. It comes with a standard 1600cc Silent Shaft powerplant, and can be ordered with our hefty 2000cc Silent Shaft Engine . . . one of the smoothest and quietest 4-cylinder engines available anywhere. It features a standard 5-speed transmission. It also comes with a new piece of standard equipment. We call it the MCA Jet System, and it's nothing short of engineering genius. In addition to the intake valve and exhaust valve, each combustion chamber has a third valve. A "Jet" valve. We've found that this third valve does two things. First, it increases gas mileage by improving combustion. Second, we even achieve better low end torque.

39 MPG HWY **29** MPG CITY*



Test drive the '78 Arrow. See why it's a lot more than just good looking. Buy or Lease Arrow at your Chrysler-Plymouth dealer.

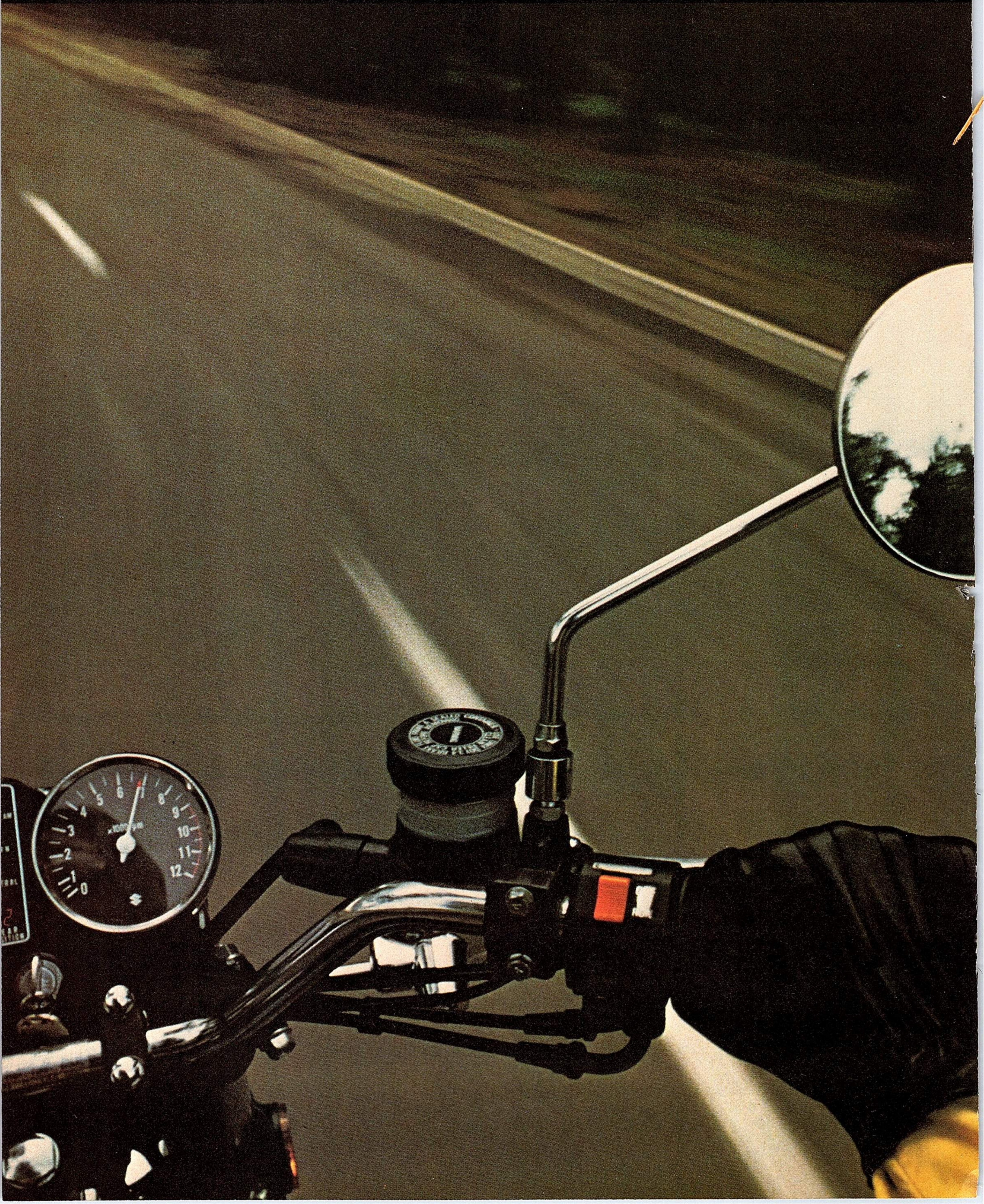
*Based on EPA estimates for Arrow's 1.6 litre engine and manual transmission. Your actual mileage may differ depending on your driving habits, your car's condition, and its optional equipment. California mileage lower.

Plymouth

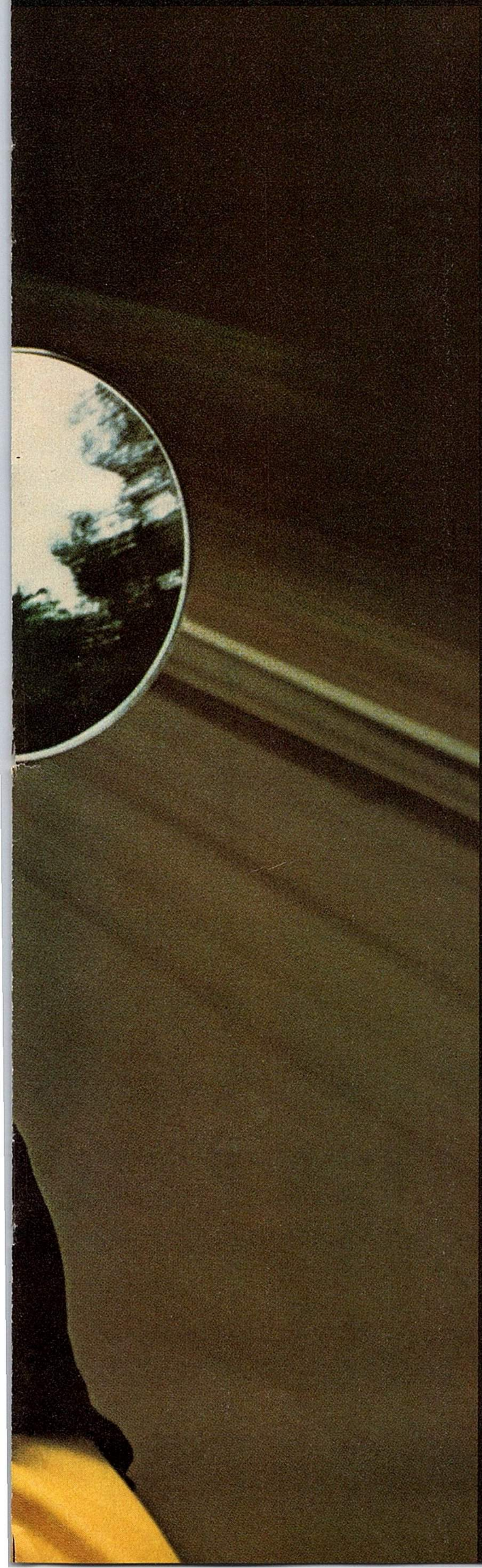
A PRODUCT OF
CHRYSLER
CORPORATION

1978 PLYMOUTH ARROW.

The Hot "U" plug from ND. Here's why



you'll buy it.



Here's why you'll tell yourself you bought it.

Let's face it. You'll probably buy the Hot "U" because when it comes to performance, it's just that. Hot.

To begin with, it eliminates most carbon fouling. So your bike is more responsive.

Its U-groove electrode allows a larger flash front for a more complete burn. So you get easier starting, an increase in torque, and guttier acceleration.

But performance aside, we think you'll discover that the Hot "U" is still the best plug you can buy. Here are a few reasons why:

The Hot "U" won't load up or hole a piston.

That's because it's designed to cover a wide heat range, and to still allow a safety factor at top and bottom to prevent fouling.

The Hot "U" can save you gas.

The reason is simple. ND designed it to fire efficiently with a leaner gas mixture. And that means you get better mileage, without sacrificing performance.

An ND Tune Up Kit with the Hot "U" can save you even more.

ND makes Tune Up Kits for 454 bike models, including Honda, Kawasaki, Yamaha and Suzuki. And most of our kits now feature the Hot "U" plug.

So besides what you can save with the Hot "U", you can also save money by tuning your own bike.

Ask your favorite motorcycle dealer or accessory shop for the Hot "U" and ND Tune Up Kits today. (If you can't find them, ask your dealer to order them for you.)

And while you're enjoying all that great performance, be sure to pat yourself on the back for what you're saving.

THE HOT "U" ND

We can hardly believe it.

Nippondenso of Los Angeles, Inc.
857 East 230th Street • Carson, California 90745
(213) 549-7660

CIRCLE NO. 31 ON READER SERVICE PAGE.

CARLSBAD GRAND PRIX: HEIKKI'S REVENGE

While Mikkola and Schmitz waited for the time-keepers decision for first overall, Mike Bell led a young American troop to six of the top 10 places.

By Dave Hawkins

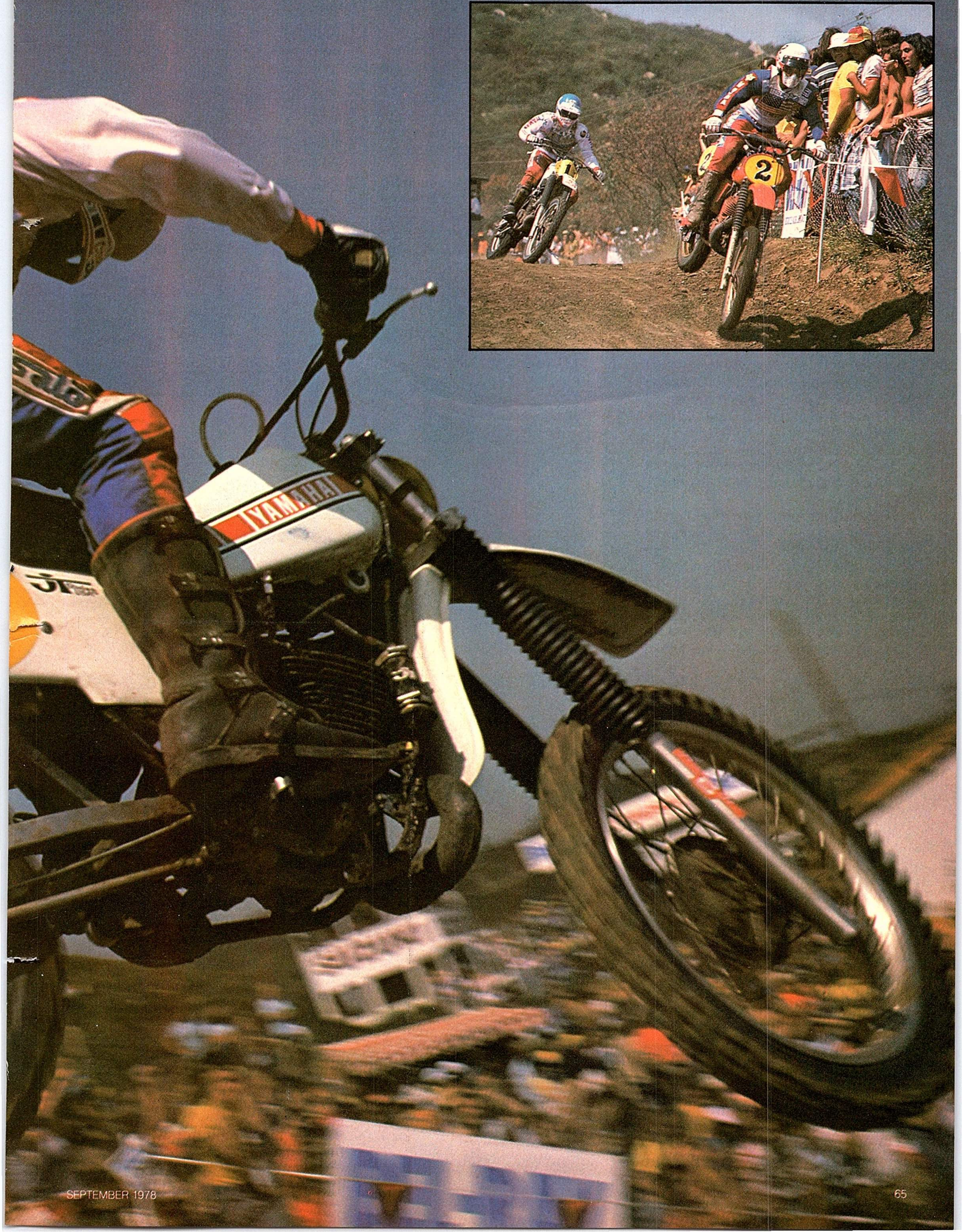
● NINETEEN-SEVENTY-EIGHT. IT COULD have been the year that the United States Motocross Grand Prix fell to an American. Carlsbad: it's as American as popcorn, apple pie and chrome hubcaps. But every year for eight years after the dust has settled at Carlsbad, the winner's trophy has been exported to Sweden or the Netherlands or Germany or someplace else. When Sylvain Geboers took the spoils back to Belgium in 1971, Brad Lackey was 16 years old, Danny LaPorte 14 and Mike Bell 13. While the Europeans came and collected their trophies through the years, the Americans grew up and got competitive. And so 1978 arrived and with it American motocrossers. This year, it seemed, Carlsbad would stop being European territory. This year the United States GP might come home to America.

And the man who would bring it home, most observers thought, was Brad Lackey. He arrived in Carlsbad just 16 points behind Heikki Mikkola, the defending 500 World Champion. Lackey had already won a GP this season, and Brad posted the fastest qualifying time, lapping in 2 minutes 18.4 seconds around the rough 1.3—mile Carlsbad circuit. Mikkola was second quickest, a little over a second behind Lackey. Former 125 World Champion Andre Malherbe recorded a 2:20.5 for third, ahead of four-time USGP winner Gerrit Wolsink and Mike Bell, racing his first Grand Prix for Team Yamaha.

His qualifying time gave Lackey first choice of starting-line positions. But at Carlsbad, where there's a steady weekly program of racing, the starting gate area is cement. The riders start on a concrete platform, bounce over the gate and onto dirt. "This is burnt," declared

(Continued)

PHOTOGRAPHY: DAVE HAWKINS, DON PHILLIPSON



Lackey. "You try to get the fastest time so you can have an advantage on the starting line, and you have to start on a patio."

With an ever improving Lackey, there were several riders capable of winning the USGP. Mikkola was off to a great start and already won eight GP motos before coming to America; Roger DeCoster, after suffering a near-fatal accident early in the season, was nearly back in form; Gerrit Wolsink, who has won every GP at Carlsbad since 1974, couldn't be counted out; and Mike Bell, a rocket on his "home" Carlsbad track, was a good long shot. As the best riders in the world sat quietly on the starting "patio," many spectators believed Lackey *would* take the victory.

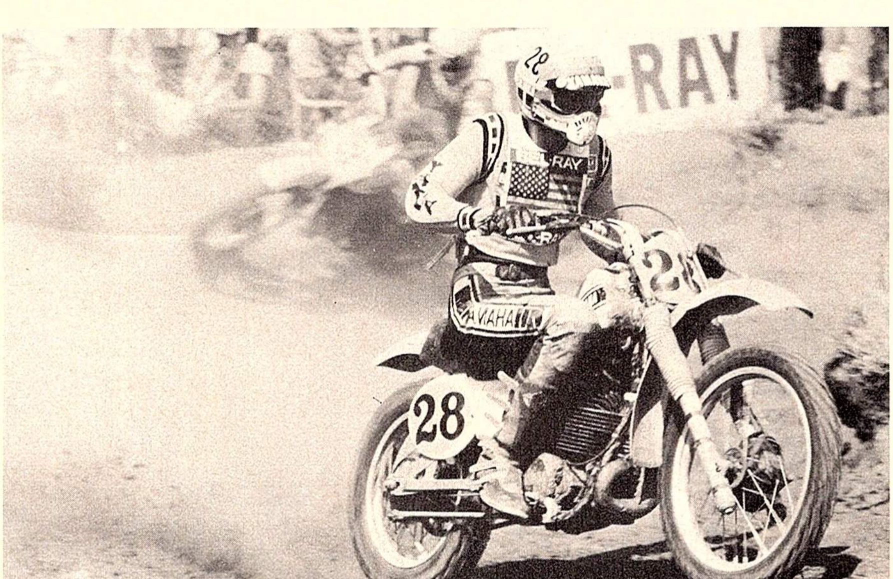
When the starting gate hit the cement, Brad got a tremendous start and led DeCoster by three bike lengths by the first turn. The crowd went wild. But no sooner had the loudspeaker system screamed out that announcement than Brad's Honda derailed its chain and skidded to a halt. As Lackey frantically replaced the chain, Rex Staten shot into the lead three seconds ahead of DeCoster. Rick Burgett held a solid third.

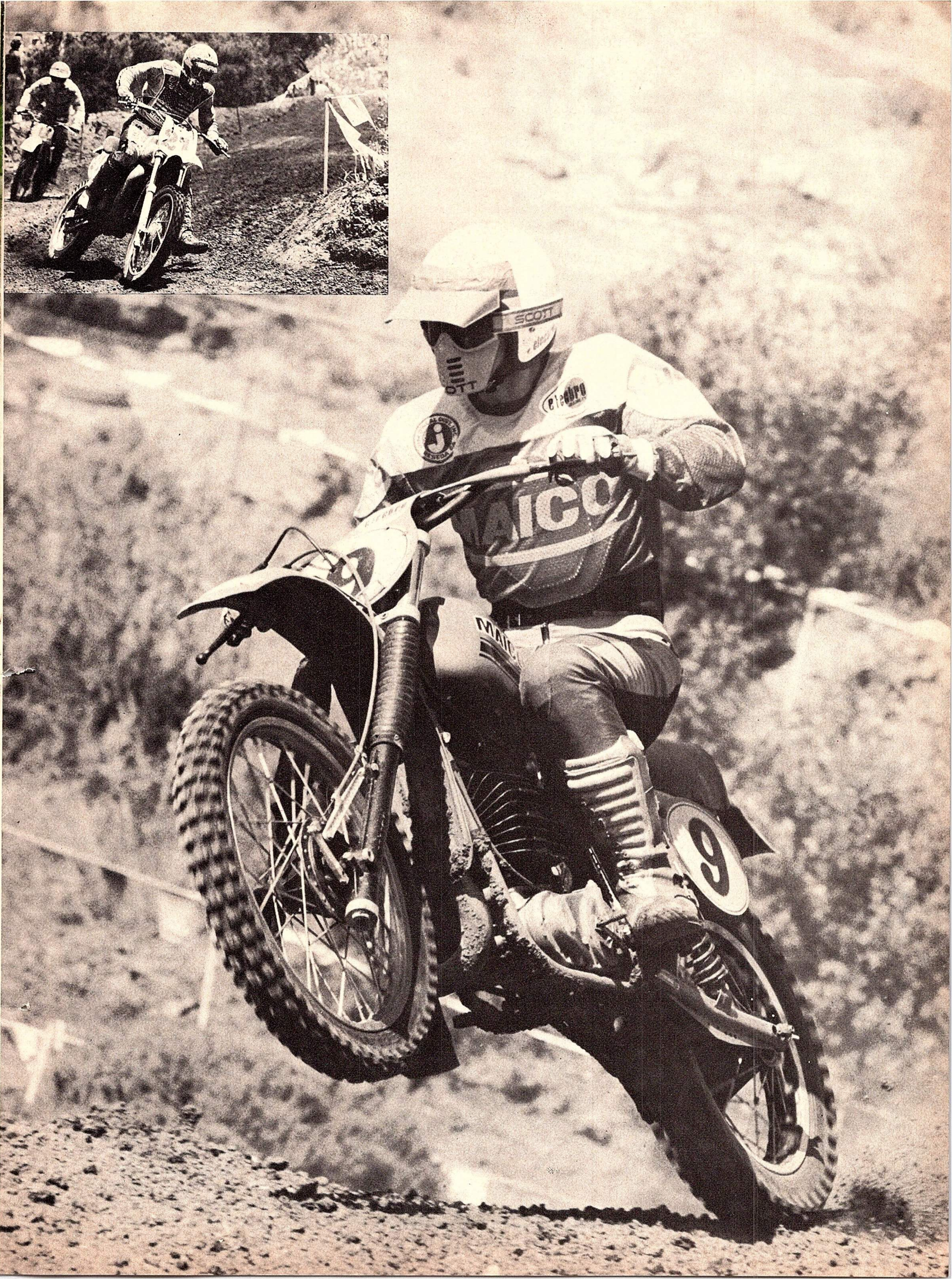
The battle for fourth was joined when Mike Bell began to apply pressure on West German Herbert Schmitz. Their running dispute lasted for about five laps, but Schmitz and Bell finally parted ways in a hairpin turn. The German missed a shift just as Bell was starting to swoop past. Bell's Yamaha clipped the rear tire of Schmitz's hesitant Maico, and the impact catapulted Mike over the bars and into the chain-link fencing.

"I hit the bars so hard with my stomach that I thought I ruptured my spleen. My legs were numb and my top lip was bleeding. My whole body ached, so I thought I would just start the bike and ride to the mechanics' area and pull off. But by the time I got all away around there, I didn't feel quite so bad. So I decided to continue racing as long as I could." Obviously shaken by the spill, Bell circulated in fifteenth place for a lap; then he began to pick off riders with each lap.

The race was beginning to run strongly in Schmitz's direction. With Bell out of the

Mike Bell (below) finished third overall in his first Grand Prix. Jimmy Ellis (bottom) won the support class. Danny LaPorte led Mikkola (inset) in the first moto until a sheared countershaft forced him to push a half-lap for sixth place. Herbert Schmitz (opp. page) couldn't crack the top ten fastest qualifiers on Saturday, but on race day he tied Mikkola with 1–3 moto scores.



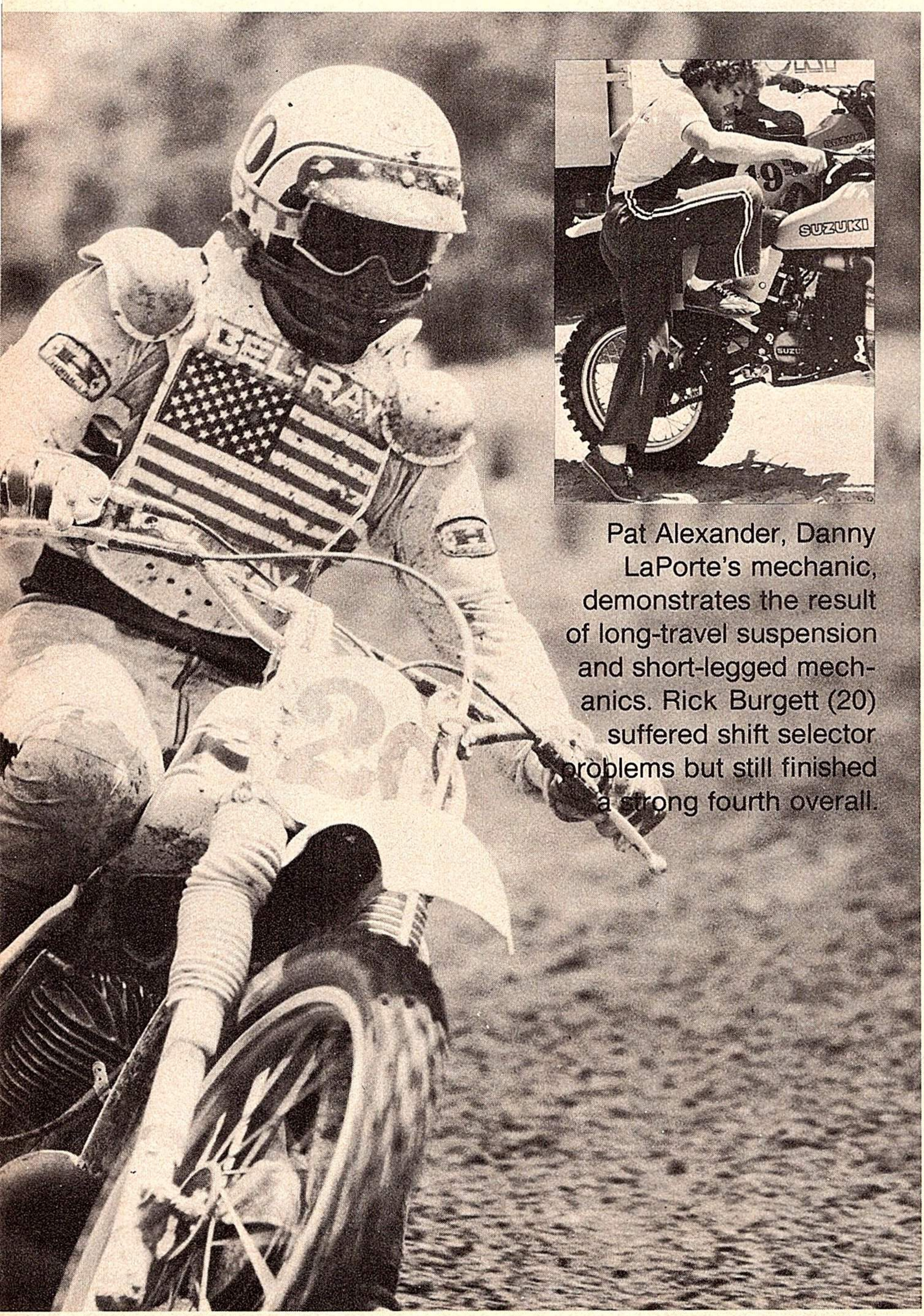

SCOTT
MAICO
MAICO
9

way, the German got a couple more lucky breaks. First, DeCoster miscalculated a turn, went down and lost a few places. Schmitz, already past Burgett, took over the lead when Staten pulled his bike off the track with a stuck piston. Meanwhile, Burgett held second some 10 seconds ahead of a determined DeCoster who—halfway through the moto—had passed Danny LaPorte and Hakan Andersson.

Burgett was in trouble. He had caught his shift lever in a rutted berm and bent it back slightly. The bend hampered fluid shifting into third, and this slight malfunction slowed Burgett who gave way to both DeCoster and LaPorte.

Rick's problems were not yet ended. Mikkola had been steadily marching through the pack from a seventeenth-position start; he pushed by Burgett, leaving him to a fast-approaching Yamaha. Wounded Mike Bell had rifled past an entire set of impressive names in national and international motocross: Smith, Croft, Wolsink and Jaak Van Velthoven. With Burgett dead in his sights, Bell pulled the trigger one more time and shot past.

The real squeeze play was in front of Bell and Burgett. Under tremendous pressure, Danny LaPorte held off World Champion Mikkola as the two-lap sign was given, and LaPorte was at the limit. "There's this one section at Carlsbad that I think I'm the fastest on. At local races I do a lot of passing there. Just before the drop-away I make a left- and a right-hand turn close together in this sweeper. I hit the first turn and then pick the bike up and throw it into the next turn, making two berms out of the sweeper; this gives me a good solid drive on the slick clay. When I was following DeCoster with Mikkola just behind me, all three of us went through that section faster than I ever had before. And Roger was using *my* line. Mikkola followed both of us and it looked like a train on a single track."



Pat Alexander, Danny LaPorte's mechanic, demonstrates the result of long-travel suspension and short-legged mechanics. Rick Burgett (20) suffered shift selector problems but still finished a strong fourth overall.

Then the countershaft splines on LaPorte's Suzuki began to shear off. The Suzuki slowed dramatically; in short order the sprocket splines were eaten out leaving LaPorte completely powerless—just short of the finish line. Danny, not content to give up, started pushing his bike toward the finish line.

Meanwhile, Schmitz's Maico cruised in to win the first moto, trailed by DeCoster and Mikkola. Mike Bell copped fourth, Rick Burgett held on to fifth. LaPorte shoved his dead Suzuki across the line for a brilliant sixth; he still finished ahead of Wolsink and VanVelthoven, seventh and eighth respectively.

Thanks to the AMA's class declaration rule, only open-class American riders could compete in the USGP for points. Kawasaki's Gaylon Mosier and Jimmy Weinert—neither of whom ride in the American open class—raced at Carlsbad, but not for points and not for an official finishing position. In reality Mosier finished the first moto in ninth place.

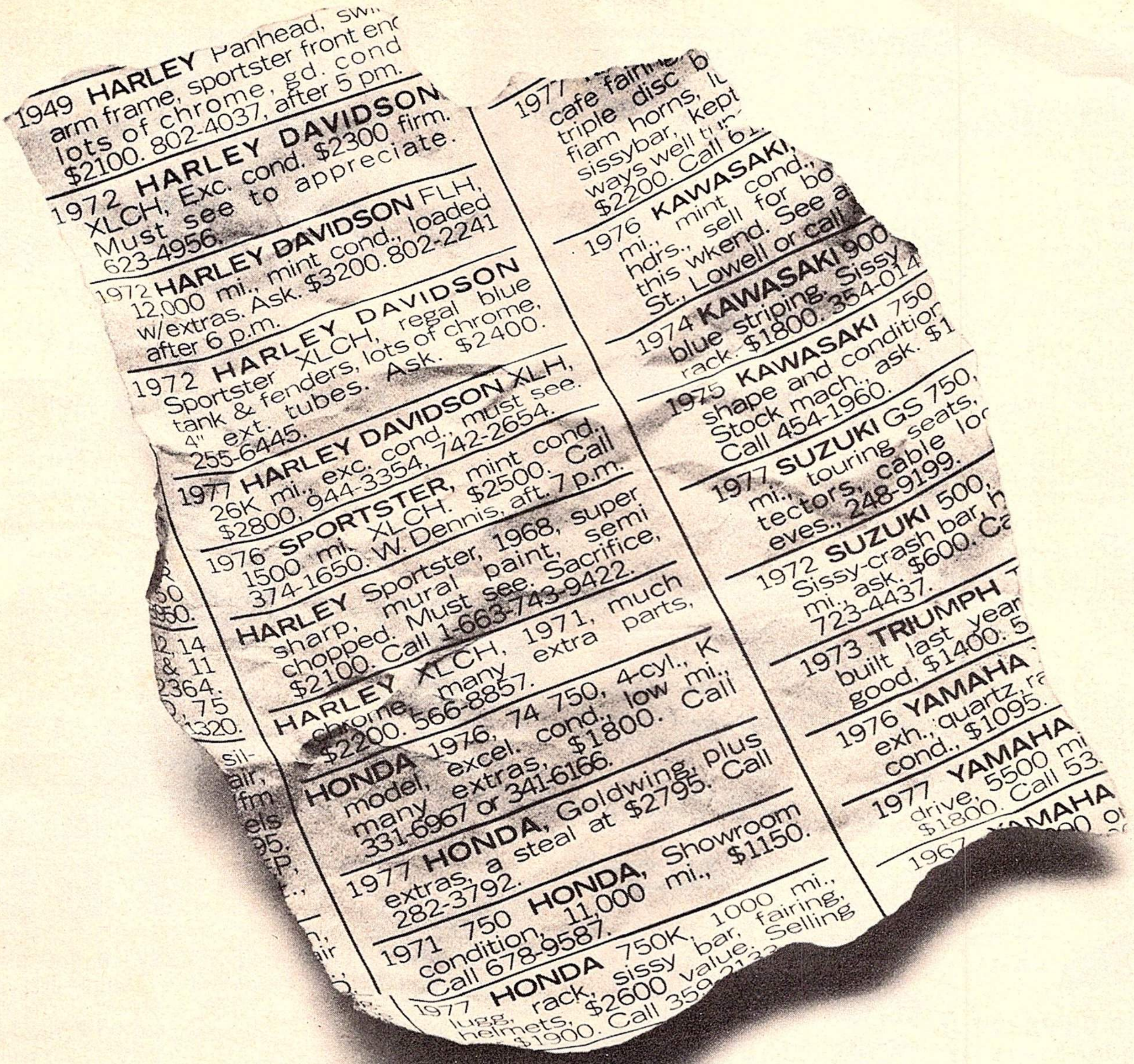
The first moto produced a lot of *If Only* talk: *if only* Brad's chain had not derailed; *if only* LaPorte's Suzuki had run just another half-lap; *if only* Mike Bell had not gone over the bars; and *if only* Rick Burgett had not bent his shift selector. Americans could have dominated the first five places, *if only*. But racing is a hard game; it ignores *if onlys* and simply recognizes the finishing order. The results of the first moto moved the first-place trophy 45 minutes from Europe.

Lackey reminded the Europeans that the Americans weren't dead yet. Brad repeated his first-moto holeshot and wheelied down the entire start straightaway to open the second moto.

While Lackey sped through the first few turns on a course that had become slick with the day's heat and racing, Heikki Mikkola was just a shadow away. By the big uphill, Mikkola had slipped by and Brad played the stalker. Behind Lackey, Europeans filled the next four places. KTM's Andre Malherbe held third place just in front of the evergreen Hakan Andersson on his Husqvarna. After a good start, Gary Semics yielded fifth to hard-charging Herbert Schmitz. DeCoster was tangled up with Van Velthoven, Semics and Bell in a tussle for sixth.

Although Carlsbad is just the seventh race of the 12-event Grand Prix schedule, Lackey and Mikkola had already established themselves the 1978 world-title leaders. The second moto followed the

(Continued on page 124)



50
950.
2, 14
& 11
2364.
, 75
320.
sil-
air,
fm
els
95.
P.

1949 **HARLEY** Panhead, sw
arm frame, sportster front en
lots of chrome, gd. cond
$2100. 802-4037, after 5 pm.

1972 **HARLEY DAVIDSON**
XLCH, Exc. cond. $2300 firm.
Must see to appreciate.
623-4956.

1972 **HARLEY DAVIDSON** FLH,
12,000 mi., mint cond., loaded
w/extras. Ask. $3200. 802-2241
after 6 p.m.

1972 **HARLEY DAVIDSON**
Sportster XLCH, regal blue
tank & fenders, lots of chrome,
4" ext. tubes. Ask. $2400.
255-6445.

1977 **HARLEY DAVIDSON** XLH,
26K mi., exc. cond., must see.
$2800. 944-3354, 742-2654.

1976 **SPORTSTER**, mint cond.
1500 mi. XLCH. $2500. Call
374-1650. W. Dennis, aft. 7 p.m.

HARLEY Sportster, 1968, super
sharp, mural paint, semi
chopped. Must see. Sacrifice,
$2100. Call 1-663-743-9422.

HARLEY XLCH, 1971, much
chrome, many extra parts,
$2200. 566-8857.

HONDA 1976, 74 750, 4-cyl., K
model, excel. cond., low mi.,
many extras, $1800. Call
331-6967 or 341-6166.

1977 **HONDA**, Goldwing, plus
extras, a steal at $2795. Call
282-3792.

1971 750 **HONDA**, Showroom
condition, 11,000 mi., $1150.
Call 678-9587.

1977 **HONDA** 750K, 1000 mi.,
lugg. rack, sissy bar, fairing,
helmets, $2600 value, Selling
$1900. Call 359

1977
cafe fairing b
triple disc b
fiam horns, l
sissybar, kept
ways well t
$2200. Call 61

1976 **KAWASAKI**,
mi., mint cond.,
hdrs., sell for bo
this wkend. See a
St., Lowell or call

1974 **KAWASAKI** 900
blue striping, Sissy
rack. $1800. 354-014

1975 **KAWASAKI** 750
shape and condition
Stock mach., ask. $1
Call 454-1960.

1977 **SUZUKI** GS 750,
mi., touring seats,
tectors, cable lo
eves., 248-9199.

1972 **SUZUKI** 500,
Sissy-crash bar, h
mi., ask. $600. Ca
723-4437.

1973 **TRIUMPH**
built last year
good, $1400. 5

1976 **YAMAHA**
exh., quartz, r
cond., $1095.

1977 **YAMAHA**
drive, 5500 mi
$1800. Call 53

1967 **YAMAHA**
000 o

OUR RIDERS WRITE BETTER ADS THAN WE DO.

The cost of a motorcycle is not the sticker price. If you've ever had to sell anything less than a Harley-Davidson,® you understand. Your actual cost is the difference between original purchase price and resale value.

The bottom line is right there in your local newspaper. Regardless of where you live, the story's the same throughout the country. Compared to the Japanese manufacturers,* Harley-Davidson's retain by far the greatest percentage of their original selling price.

Why? Is it the classic styling? The legendary durability and ease of maintenance? The 76 years of refinement behind the V-Twin engine? Or is it something bigger. Like a fundamental understanding of the essence of motorcycling.

However you weigh the reasons, it's a fact. And if you need more convincing than your local press, check the motorcycle blue book or the N.A.D.A. appraisal guide. A Harley-Davidson is more than a unique motorcycle. It's the one sound investment in motorcycling.

AMF
Harley-Davidson

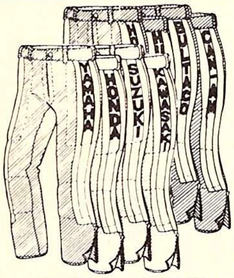
*Based on 800cc+ engine displacement

UNTIL YOU'VE BEEN ON A HARLEY-DAVIDSON,
YOU HAVEN'T BEEN ON A MOTORCYCLE.

CIRCLE NO. 36 ON READER SERVICE PAGE.

Hi-Q PRODUCTS, INC.

Free Gifts FREE CATALOG



Heavy 14-oz. Denim M/X PANTS

Team Names Team Colors $18.99

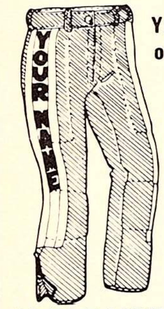
Excellent quality, highly protective, and smartly styled. Cycle name in bold black letters on both sides. Striping in team colors. Removable hip and knee pads. Knee pockets will accomodate cups. (No. 75 pants have no cycle name, are striped red, white and blue.)

Red, White, Blue Stripes, No Name $17.99

Waist Sizes: 24-26-28-30-32-34-36-38-40

No. 71 Yamaha	$18.99	No. 85 Hodaka	$18.99
No. 72 Honda	$18.99	No. 86 Husqvarna	$18.99
No. 73 Suzuki	$18.99	No. 87 Bultaco	$18.99
No. 74 Kawasaki	$18.99	No. 88 Can-Am	$18.99

No. 75 Red-White-Blue, No Team Name $17.99



Your Name or Other Message on Stylish Heavy 14-oz. Denim M/X PANTS $24.99 pr.

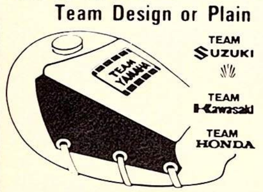
Our top-quality heavy blue denims, as described above, PERSONALIZED FOR YOU. Up to 10 letters each side. 3 colorful trim styles. Use special lines in order blank. No CODs.

Waist Sizes 24-26-28-30-32-34-36-38-40

No. 56P Gold and Black Trim
No. 57P Red and White Trim
No. 58P Green and White Trim

M/X RACING TANK COVER $8.99

Team Design or Plain

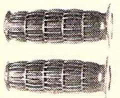


Snug-fitting snap-on cover of heavy-duty simulated leather prevents scratches, scrapes and nicks. In bright team colors, team design lettering. Fits all tanks.

No. 26 Yam	No. 28 Suz
No. 27 Hon	No. 29 Kaw

No. 30 No Team Name

ENDURO GRIPS $1.99 pr.

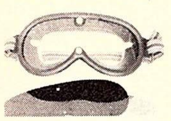


Scrambler Type No. 55 **2 pr. $3.49**

Fits all bikes. Black only.

RACING GOGGLES

$6.99 ● 2 pr./$12.99



Unbreakable, ventilated, adjustable. With 3 interchangeable lenses (clear, amber, green) No. 59

Chest Protector $8.99

In bright team colors. One size fits all.

51 Yam 52 Hon 53 Suz 54 Kaw
61 Hod 62 Husq 63 Bul 64 Can-Am

Fender FLAP $1.99

Heavy black plastic with mounting hardware. WE PAY POSTAGE No. 109

TOUGH M/X GLOVES

$7.99 pr.	**$6.99 pr.**
Heavily padded tough black vinyl. Adjustable. No. 36 Gloves	Long-wearing brown cowhide. Sizes S-M-L-XL No. 37 Gloves

CHAIN BRACELET $2.99

No. 70 Boy's
No. 80 Adult
Heavy Chrome Finish

©1978 Hi-Q Products, Inc. - 205/585-3588
Box 455-C9 - Abbeville, Alabama 36310

America's Greatest Value! NYLON MOTOCROSS PANTS

Personalized, Team Name; or Plain

Heavy nylon pants fully padded, with team name or your name or other message in bold letters across back. Glossy nylon resists tears, snags, abrasion, weather and wind. Scotchgard finish repels water and stains. Machine washable. Talon heavy-duty zippers. Snap rear pocket. Two brilliant color choices.

Waist Sizes 24-26-28-30-32-34-36-38-40

Colors: Racing BLUE with RED trim, OR GOLD with BLACK trim. SPECIFY COLOR

No. 100 Plain **$29.99 pr.**

No. 100P (No CODs) PERSONALIZED Give lettering in coupon **$34.99 pr.**

Nylon M/X Team Pants $31.99 pr.

101 Yamaha	103 Suzuki	105 Hodaka	107 Bultaco
102 Honda	104 Kawasaki	106 Husqvarna	108 Can-Am

Genuine VESSEL IMPACT DRIVER

No. 60 **$9.99 complete**

With 4 bits, heavy metal case.

Team Cap $4.49

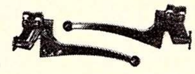
Heavy twill, brilliant team colors. One size fits all.

21 Yam 23 Suz
22 Hon 24 Kaw

Unbreakable LEVER ASSEMBLY

$7.99 set

No. 35



Guaranteed unbreakable brake and clutch levers. Mount to any handlebars without removing grips. Black.

Crossbar Pad

Team Colors

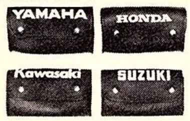
8" $2.49 ● 12" 2.99

41 Yam 43 Suz
42 Hon 44 Kaw
45 Plain Black

TOOL BAG $4.99

Tough simulated leather. Team design. Inner loop for safe mounting. 5"x7½"

No. 65 Yam
No. 66 Hon
No. 67 Suz
No. 68 Kaw
No. 69 No Name



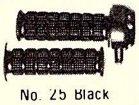
HEX GRIPS $2.49 pr.

Quality grips fit all handlebars

38 Clear 39 Yellow
40 Black

Vented DUCKBILL $2.49 each

Fits all helmets.
No. 48 Black
No. 49 Yellow
No. 50 White



No. 25 Black

Quick Release THROTTLE SET $4.99

For super-fast throttle action. Extra-large nylon head. Nylon tube and cable stop. Dummy grip included. Fits all handlebars.

$1.00 OFF ALL JERSEYS 5-Day Delivery Guaranteed!

Long Sleeve NYLON JERSEY

Regular $8.99 - NOW $7.99

Vivid Team Colors - Top-quality ventilated 100% nylon jersey made by our own craftsmen. Cycle name on chest and sleeves

Sizes: Adult S-M-L-XL; Child 6-8, 10-12, 14-16

No. 11 Yamaha, No. 12 Honda, No. 13, Suzuki, No. 14 Kawasaki

PERSONALIZED TEAM JERSEY

With Short or Long Sleeves

Your name or other message on back of nylon team jersey. 1 or 2 lines, up to 10 letters per line. Giant numerals from 0 to 99. Jerseys described above and below. Use special lines in coupon.

Short Sleeve Reg. $9.99 NOW $8.99		NO CODs	Long Sleeve Reg. $12.99 NOW $11.99	
76P Yam	78P Suz		11P Yam	13P Suz
77P Hon	79P Kaw		12P Hon	14P Kaw

Sizes: Adult S-M-L-XL Child 6-8, 10-12, 14-16

SHORT SLEEVE NYLON JERSEY

Reg. $5.99 NOW $4.99

Team Colors

Hi-Q's great nylon team jersey. Cycle action design on chest.

76 Yam 78 Suz
77 Hon 79 Kaw

Adult S-M-L-XL; Child 6-8, 10-12, 14-16

PLAIN M/X JERSEY - No Team Name

Plain or Personalized

SHORT SLEEVE

Reg. $4.99 Now $3.99 No Lettering		Reg. $8.99 Now $7.99 Personalized
No. 90	White	No. 90P
No. 91	Black	No. 91P
No. 92	Red	No. 92P
No. 93	Green	No. 93P
No. 94	Gold	No. 94P

LONG SLEEVE

Reg. $7.99 Now $6.99 No Lettering		Reg. $11.99 Now $10.99 Personalized
No. 15	White	No. 15P
No. 16	Black	No. 16P
No. 17	Red	No. 17P
No. 18	Green	No. 18P
No. 19	Gold	No. 19P

Our top-quality ventilated nylon jersey, 5 colors, long or short sleeves, no team markings. Plain, with no lettering or PERSONALIZED with 1 or 2 lines, up to 10 letters per line. 1 or 2 giant numerals. Use special box in coupon.

NO CODs ON PERSONALIZED JERSEYS

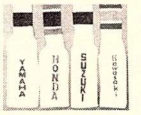
Sizes: Adult S-M-L-XL; Child 6-8, 10-12, 14-16

TEAM SOCKS $2.99

2 pr. $5.49 - 4 pr. $9.99

Heavy protective cotton socks. Cycle name and trim in team colors. One size fits all.

31 Yam 32 Hon 33 Suz 34 Kaw



Lettering Here for DENIM or NYLON PANTS

Hi-Q PRODUCTS, INC.
P. O. Box 455-C9
Abbeville, Alabama 36310
Phone 205/585-3588

*FREE GIFTS! Free BUNGIE CORD with $10 order. Free 4-WAY BUNGIE with $20 order.
*5-DAY DELIVERY GUARANTEED or your money back if you send cash or M.O., or Credit Card. Checks take 2 weeks to clear our bank. Allow extra week for custom-lettered items.
*Order $20 or more and we ship FREE!

REMEMBER: FULL GUARANTEE on everything sold. 5-DAY DELIVERY or your money back. FREE GIFTS with $10 order or more.

QUAN	NO	DESCRIPTION	SIZE	PRICE

Print Lettering Here for PERSONALIZED JERSEY

10 letters maximum each line

Numeral

WE GUARANTEE Everything We Sell!

Orders under $20 add $1 shipping
COD Orders add $3 shipping
TOTAL

Need more space? Use separate sheet.

Name
Address
City State Zip

☐ Cash Enclosed
☐ Ship COD, I enclose $3 deposit
☐ M. O. ☐ MasterCharge
☐ Check ☐ VISA (BankAmericard)
Card No.

Exp. Date

PHOTO: DAVE HAWKINS

The Insurance Shell-Game Rates, Risks And The Royal Run-Around

By Rich Taylor

● EVERYONE FIGURES HE'S GETTING shafted on motorcycle insurance. Everyone is right. But trying to figure who's to blame is like trying to reconstruct that eighteen-and-a-half-minute gap on the Watergate tapes. Not only is the insurance industry one of the great impenetrable monoliths of our time, but anything that has to do with motorcycles immediately gets everyone's hackles up. For example, the Maryland Office of Highway Safety tried to write a report on motorcycle fatalities and insurance. Their conclusion: "The greatest obstacle in the production of this report was the weeding out of arguments (both pro and con) which relied on emotionalism, moralism, legalism, and various efforts by both sides to alter the findings."

The problem is that the insurance industry as a profession attracts people who tend to be very conservative, very colorless and very conformist, and who think in long-range terms; while by contrast motorcyclists are more likely to be very independent, very colorful, very freewheeling types who live day-to-day. There's a basic lack of understanding on the most fundamental level. Most insurance people simply can't understand why anyone would want to ride a motorcycle and so figure their rates accordingly, while most motorcyclists can't understand why they should have to pay a premium just for the privilege of traveling on two wheels. The result is that you get sparks every time the two sides come into contact, and while not everyone involved is deliberately falsifying information, everything *is* slanted to prove a point.

The rising cost of motorcycle insurance reflects this. Insurance rates don't just rise or fall of their own volition, they're raised or lowered *by* someone, for a reason. Your rates might be going up because your insurance underwriter thinks his company is honestly losing money at the current rates, because a stolen motorcycle ring is operating in your town or because your state insurance superintendent just came back from two weeks in Bermuda hosted by an insurance company executive. To understand skyrocketing motorcycle insurance, you have to understand what's happening in a lot of other areas first.

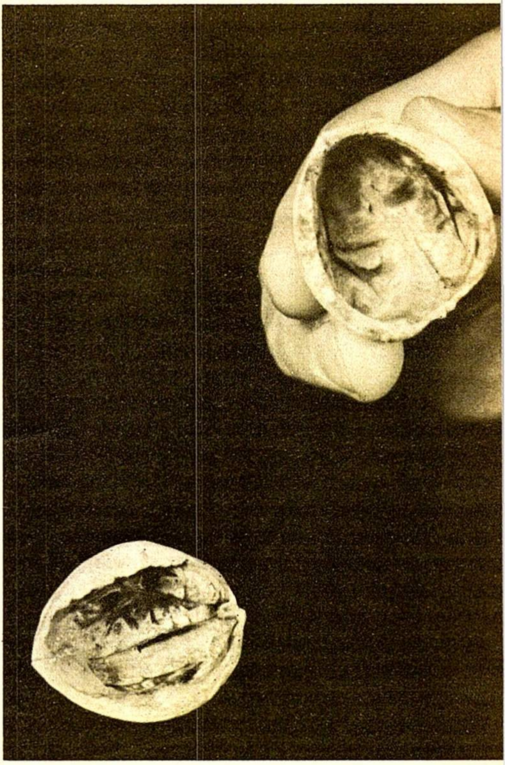
Most people think of themselves as "us" and the insurance companies as "them." But insurance is nothing more than a pari-mutuel betting pool, just like you find at the horse track. Everybody puts in his bet in the form of a premium, and the winners—or losers, depending on your point of view—get back money in the form of claims settlements. At the horse track, the state takes in taxes five per cent of all the money bet—the handle—and the track takes 12 per cent to cover its overhead and profits. The other 83 per cent is paid back in the form of winnings.

In the insurance industry, on the other hand, the state takes its five per cent, the insurance company takes 20 per cent to cover overhead and profits, and your local insurance broker takes 20 per cent as his commission. This only leaves 55 per cent of the pari-mutuel insurance handle to be paid back in claims, compared to 83 per cent at the track. But unlike pari-mutuel betting where all the money goes back to the winners, the insurance company—the bookie, if you will—also gets to keep whatever's left in the pool after all the claims are paid. It's to his benefit *not* to pay off, which is why so many insurance claims end up in lawsuits.

The insurance company does have one problem a normal bookie doesn't have. In a horse race, you know the minute the field crosses the line who the winners are. But in the insurance business, it might take literally years before all the claims are paid off for a given set of premiums. By law, an insurance company has to keep in reserve a percentage of the total premiums it writes in order to make sure it'll have enough money to pay off any claims. In the old days this was 50 per cent, but nowadays most companies keep only 20 per cent reserves to cover policies.

Assume that your one-year motorcycle premium is $120. If you don't have any claims the first month, the insurance company has in effect "earned" one-twelfth of the premium, or $10. This earned premium goes to pay for overhead and profits. Whatever's left is "surplus." The remainder of the premium is "unearned premium," and it gets lopped off one month at a time. The insurance company collects interest on the unearned premium until it becomes "earned," then invests the surplus as available.

The favorite place for insurance companies to invest surplus has always been the stock market, and these tremendous amounts of capital have made the insurance companies the most powerful force on Wall Street. But since 1972, the stock market has declined wickedly. So virtually every insurance company in the country has lost money in the market . . . up to $100 million a year for big companies like Allstate, State Farm and Geico. As a whole, the insurance industry lost $4.5 billion in 1975 and $2.3 billion in 1976, and those are staggering losses. The principal way for the insurance companies to make up their losses and maintain their legal reserves is to raise the rates they charge you. Motorcycle rates, like automobile rates, have gone up because insurance companies made bad stock investments. In the end the insurance companies' problems become your problem. The buck stops at your mailbox.



Insurance rates are set by a state insurance commission which is headed by a superintendent appointed by the governor. All too often the state insurance superintendent is a former insurance company executive. Each year, any company which expects to sell motorcycle insurance in the state must file its prospective rates with the commission. If the rates are too high, the superintendent will in theory disallow them rather than unduly burdening the consumers.

On the other hand, if the rates are too low, the superintendent will again disallow them because that would unfairly undercut all the other insurance companies. The insurance business is essentially *very* conservative, so anything that deviates from the norm is viewed with suspicion. But the norm is decided by the insurance companies and the superintendent, in what's all too often an extremely cozy arrangement in which only the consumers can lose.

There's another intriguing political aspect to motorcycle insurance. For all intents and purposes, the motorcycle is an imported device, and in some circles motorcycles are thought of as competition for the automobile. This doesn't go down too well in some places—Detroit, for example—and more than one insurance expert hinted that United Auto Workers lobbyists might be more responsible for high motorcycle insurance rates than any other group. It's an intriguing thought, though the most interesting part about it is how far afield the insurance industry is willing to go in order to shift the blame for higher premiums.

Sometimes you get a maverick insurance superintendent like the current one in New York. Superintendent Lewis is much more consumer-oriented than most state superintendents, and he has put a moratorium on insurance rates this year. He also decided that motorcyclists in New York State should carry No-Fault insurance to protect pedestrians or other drivers run down by a motorcycle. Five years ago motorcycles were included in New York's first No-Fault law, which would have meant that motorcycle insurance companies would have to pay for your injuries if you fell off your bike. The companies successfully lobbied to get motorcycles put outside No-Fault, saying that if they had to pay off every time some kid fell off his motorcycle, the premiums would be impossibly high.

One of the results of this turn of events was that if a pedestrian were run down by a car his medical payments would be covered, but if he were run down by a motorcycle he would have to sue in order to get anything. The new New York law provided No-Fault "pedestrian knock-down" coverage and is a model for similar laws in other states. A knocked-down New York pedestrian can now get up to $50,000, compared to the maximum liability coverage of $10,000 that insurance companies formerly offered in New York.

From the injured pedestrian's point of view this is wonderful. To help the insurance companies make up the difference, Superintendent Lewis allowed them to raise their premiums $10, which to the individual rider isn't so bad. But from the insurance company's point of view, if just one person wins a $50,000 lawsuit instead of the former $10,000 maximum settlement, it's going to take 4000 motorcyclists times that extra $10 premium to pay off that one claim. The companies say that there's no way the plan can work; every 4000 motorcyclists will run over a handful of pedestrians in the course of a year.

Since the program is new, there's no actuarial base to determine whether the superintendent is right or the companies are right. It will take years to find out; and if the estimate is low, the insurance companies will have to make up the difference, which could run into millions. Of course, if the estimate is too high, New York motorcyclists will have paid even more money to insurance companies with no way of ever getting it back.

There's another problem that goes along with pedestrian knock-down protection and bodily injury coverage for passengers. The average medical bill was $508 in New York state in 1975, compared to $275 in 1973. In the decade between 1967 and 1977, the cost for a hospital room increased over 200 per cent. Obviously, as medical bills go out of sight, insurance claims and insurance premiums have to rise at the same rate. And you wonder why your motorcycle insurance costs more?

Motorcycle insurance is undoubtedly a low-profit item by insurance company standards. According to Leo Cisper of Universal Underwriters, it costs an average of $11.25 to process an insurance policy. *Any* insurance policy. The administrative cost is the same for a corporate liability policy with a $10,000 premium, a new car policy with a $700 premium or a motorcycle policy with a $60 premium. In other words, motorcycle insurance is disproportionately expensive for an insurance company to handle. By the same

An Insurance Industry Plan To Lower Rates

Prepared by the NAII Motorcycle Committee, September, 1977.

Theft Reduction

√ Make engine and frame vehicle identification numbers the same, and have the numbers include a code that tells model, size, color, etc.

√ Use a greater number of key patterns.

√ Don't place key serial numbers on locks.

√ Require riders to turn in old parts with a VIN number before they can buy a replacement part.

√ Have dealers check vehicle identification numbers against registration on new bikes (at least 20 per cent of all bikes are falsely registered).

√ Require proof of ownership before selling replacement keys.

√ Require vehicle identification number to match registration at inspection time.

√ Require inspection of "homemade" bikes before registration, and check all vehicle identification numbers.

Accident Reduction

√ Engineer motorcycles to reduce costs of crash parts.

√ Change advertising themes away from high-performance emphasis.

√ Discourage choppers, high bars and extended forks.

√ Increase availability of rider training courses for current riders.

√ Require rider training courses for all new riders.

√ Promote safety items like helmets and reflective clothing.

√ Develop reliable and safe straightening methods for frames and fork tubes.

√ Require all motorcyclists in all states to wear helmets.

√ Require all motorcyclists in all states to ride with headlights on at all times.

√ Establish nationwide uniform and stringent motorcycle riding tests and written exams.

—Rich Taylor

- Are motorcycles *really* more dangerous than automobiles? If you listen to self-styled "safety experts" like Albert Benjamin Kelley of the Insurance Institute for Highway Safety, motorcycles should be banned or limited in size and speed since "characteristics in crashes suggest them to be strongly associated with exceptionally large amounts of human damage that cannot otherwise be controlled." According to Kelley, "motorcycle fatalities have been increasing sharply since 1969."

Says Laurie Cray Sadler writing in *Today's Health,* "Ninety-three per cent of the accidents involving motorcycles result in death or injury (while the figure for all types of motor vehicles is only eight per cent)." Most other motorcycle critics depend more on invective than statistics, but their idea is the same . . . motorcycles are *dangerous* things.

Between 1964 and 1975, the number of motorcycles on American roads increased from 985,445 to 4,996,800, according to *Traffic Safety '76,* published by the Department of Transportation. That's an increase of 404 per cent. In the same period, motorcycle fatalities increased from 1175 to 3282, according to the DOT, an increase of 179 per cent. In other words, riding a motorcycle is actually twice as safe today as it was in 1964, not less safe as Kelley implies.

But there's more. The number of miles traveled per year by each motorcycle has increased from 2300 in 1964 to 4500 in 1975, according to the DOT, doubling the exposure to risk. In addition, the motorcycle is primarily a short-trip vehicle used for local riding, so the vast majority of the 22.3 billion miles traveled by motorcyclists in 1975 were on local roads, according to *Traffic Safety '76.* Automobile drivers, on the other hand, drove almost 800 billion miles on divided highways in 1975, according to the DOT, compared to 500 billion miles on secondary roads. The automobile fatality rate per 100 million miles on Intertoken, the broker's 20 per cent commission on a $700 automobile policy is far more attractive than his commission on a $60 motorcycle policy. Hard to believe as it may be, it's almost impossible to make real money off motorcyclists with motorcycle insurance.

This has the predictable effect. Big companies like Allstate and State Farm can't be bothered with motorcycle insurance. The only time they'll write motorcycle coverage is for someone who is married and already has a house, a car and maybe a boat insured with them. A married person who owns property is always a preferred insurance risk. Under normal circumstances, Allstate won't write a motorcycle policy for an 18-year-old kid who owns nothing but his bike.

There are two kinds of insurance companies. The first consists of the big national companies like Allstate that insure almost everything. They'll take in $3 billion a year in premiums, maybe more. Then there are small, usually local companies that issue "specialty" insurance for "substandard risks" like snowmobiles, mobile homes and motorcycles. The largest of the motorcycle companies, Universal Underwriters, sells less than $10 million a year in premiums.

Obviously, the big companies can offer lower rates because they select the best risks and have a lot of money behind them, while the undercapitalized specialty companies must take the poorer risks. In addition, a big insurance company can use the huge profits it makes on things like life insurance and home owner's insurance to offset its losses on motorcycle insurance. The big companies not only have the best risks, but in effect they can subsidize the rates. At the same rate approved by the state superintendent of insurance, a big company can make money, while a small company might well go bankrupt.

The guiding rule of any insurance company is to minimize risk, since the more claims there are, the less surplus is left over for the company at the end of the

The Great Motorcycle Fatality Flap

state Highways was 1.43 in 1975, compared to 5.38 for secondary roads, (3.2 combined) according to *Fatal and Rates,* published by the DOT. Highways *Injury Accident* are almost four times safer than local roads, in other words.

While the automobile fatality rates per mile quoted by "experts" are artificially lowered by ultra-safe highway driving, motorcycle fatality rates per mile are much higher because motorcycles have comparatively little controlled-access highway use and are therefore exposed to a disproportionate risk on secondary roads. The average motorcycle fatality rate per 100 million vehicle miles in 1975 was 14.71. The "experts" consistently divide 14.71 by 3.42 and announce that motorcycles are 4.3 times more dangerous than cars. But the proper equation is 14.71 divided by 5.38, or 2.7 times more dangerous.

But you can't just stop there. The figures for vehicle use and vehicle registrations for both motorcycles and cars are figured on street use only. But the fatality figures for motorcycles are for all deaths. There are actually 8.3 million motorcycles in this country, 5.4 million of which are ridden off the road according to the Motorcycle Industry Council *1977 Motorcycle Statistical Annual.* No one accurately knows the mileage racked up by these machines, but almost all fatality studies agree that at least 10 per cent of motorcycle deaths occur off the road. These deaths are artificially inflating the fatalities-per-vehicle-mile figures for motorcycles, since the mileage and number of vehicles are not reported, while the deaths are.

The average age of a motorcyclist in this country is 25; the average age of an automobile driver is 37. According to the Department of Transportation, "Drivers under 25 are overinvolved in all types of accidents." Automobile drivers under 25 account for 22.5 per cent of all drivers, but 39 per cent of all fatalities. Motorcycle riders under 25 account for 50 per cent of all riders, but almost 80 per cent of all fatalities. There are twice as many accident-prone younger riders on motorcycles compared to cars, which distorts motorcycle fatality figures by almost 40 per cent compared to cars. This has to be taken into consideration. In addition, female drivers are much safer drivers than men, and 46 per cent of automobiles are driven by women. By comparison, 92 per cent of motorcycle riders are men, so the statistics are unfavorably skewed on that account as well.

There's another study that's very important and usually overlooked. Called *Alcohol and Motorcycle Fatalities* and written by Susan Baker and Russell Fisher, M.D., this study shows that from January 1973 through June 1975, of all the motorcyclists killed in Maryland, 66 per cent had alcohol in their blood streams and 50 per cent were legally drunk. These figures are about 15 per cent higher than those for automobile drivers. According to Baker and Fisher, "Impairment by alcohol may well be the most important human factor contributing to fatal motorcycle crashes."

Baker and Fisher also point out that 63 per cent of fatal motorcycle accidents involve another vehicle, and that in 29 per cent of *all* motorcycle accidents, a car made a left turn into the path of an oncoming motorcycle. According to *The Second International Congress on Automotive Safety: Report on Motorcycle Safety,* published by the DOT, "The automobile driver is at fault in more than 70 per cent of all car/motorcycle conflicts." In other words, 44 per cent of all motorcycle fatalities are caused by an automobile driver who most likely didn't even see the motorcyclist he killed.

This same DOT report states that "Twenty-five per cent of all accident involvements occur within the first six months of exposure, and in the case of riders operating machines over 125cc displacement, 40 per cent of the accidents involved riders in their first year of exposure, 27.9 per cent in the second year, and a dramatic drop to 9.8 per cent in the third year." This means that a total of 68 per cent of motorcyclists involved in accidents had been riding less than two years.

Albert Benjamin Kelley is right in only one respect. Motorcycles *are* overinvolved in fatal accidents. Motorcycles account for only 3.6 per cent of all the vehicles registered in the United States, but 6.0 per cent of the fatal accidents. By comparison, however, tractor-trailer trucks account for only 0.8 per cent of all the vehicles registered in the United States, but 6.3 per cent of the fatal accidents. Even though heavy trucks are overrepresented in fatal accidents by a factor of 790 per cent, compared to 166 per cent for motorcycles, Albert Benjamin Kelley isn't suggesting that 18-wheelers should be banned or limited in size or speed. Motorcyclists are an easy target for people like Kelley, because as a group they're young, unorganized, underfinanced and powerless compared to large organizations like the Teamsters Union.

The fact remains that motorcycles, once you correct all the biased or inaccurate statistical evidence, appear to be not substantially more dangerous than cars. Of the people who get killed on motorcycles, 66 per cent are drunk, 50 per cent are under 24 years old, 68 per cent have been riding less than two years, and 44 per cent are picked off by cars. *Lesson One:* Motorcycles aren't more dangerous than cars, motorcycle riders are more dangerous than automobile drivers. *Lesson Two:* Automobile drivers don't see the motorcycles sharing their road space and must be treated as blind and lethal enemies. Ignore these lessons and you're bound to end up as more statistical ammunition for Albert Benjamin Kelley's war against the motorcycle.

—Rich Taylor

year. An insurance company determines its rates from an actuarial base, which simply means they analyze all the claims they've had in the past five years before they decide what the new rates will be. According to Leo Cisper of Universal Underwriters, it takes a minimum of five years and $5 million in losses before a true statistical picture emerges.

According to Universal's statistics, for example, Kawasaki big-bore two-stroke triples and 903cc Z-1s are the most accident-prone motorcycles on the road, because Kawasaki has a performance image and thus attracts the type of rider who'll ride harder and faster than normal. Obviously, they're the type who'll have accidents. Big Kawasakis, as motorcycles, in all likelihood are no more dangerous than other Superbikes—their riders are just more willing to take risks.

Harley-Davidsons present another kind of problem. One out of every five Harley-Davidsons that's insured is stolen. In order to pay off this 20 per cent claims ratio and still make a profit, an insurance company has to charge a premium of 35 per cent of the value of the motorcycle in order to provide theft insurance on a new Sportster. Says Leo Cisper, "This is the point of diminishing returns. The only person who'll pay a $1000 premium on a $3000 motorcycle is someone planning to have it 'stolen,' so we won't insure him." Catch-22 for Sportster owners.

The problem is that most stolen Sportsters are broken down into parts and used to build choppers, so the recovery rate on stolen Harley-Davidsons is less than two per cent, compared to 80 per cent on stolen cars of equal value. At the same time, no insurance company wants to insure a chopper, trike or anything with an extended fork, because these machines are involved in more accidents than normal. There's a strict Darwinian selection in the insurance business. By referring to his actuarial tables, an insurer like Universal Underwriters rightly or wrongly puts all Harley owners, all chopper owners, and for that matter, all Kawasaki Z-1 owners, into the high risk category.

Now even though the high risk categories will cost the insurance companies in the long run, the insurance companies still try to find a way to be rate-competitive. Another insurance company is always willing to take a chance on lower premiums and hope that its claims are less than expected. Here's where companies begin playing rate-making Russian Roulette. To remain competitive in high risk categories, insurance companies use one category of insurance to subsidize the others, hoping to offer marginally better rates in an effort to steal customers away from the competition.

This is a *very* tricky business. In New York State, for example, there's been a definable three-year cycle in motorcycle companies over the last 15 years. Normally, there are only three specialty companies writing motorcycle insurance in New York, and their rates are apparently very high. But this year there are 12 small insurance companies fighting over roughly the same number of motorcyclists, offering reduced premiums.

If the pattern holds true, the nine new companies will offer cheap insurance this year and lure a large number of clients away from the older firms. Next year they'll be hit with more claims than they expected, completely wiping out their reserves and either driving them bankrupt or out of the motorcycle insurance business. And two years from now, there will only be three motorcycle companies in New York again, with rates that seem to be too high.

One of the things companies try to do is isolate a category of machine where their actuarial records show there's been an inordinately low number of claims. Let's say that Universal Underwriters has done very well on 250cc to 350cc bikes the last

(Continued on page 84)

Motorcycle Insurance Rates

- Insurance premiums vary widely from state to state, depending on local laws, the superintendent's allowed prices and the actuarial experience in that state, which in turn depends on weather, roads, helmet laws and all sorts of other factors. For example, purchased from the same insurance company, the same minimum liability coverage or full coverage insurance on a Honda CB400 would cost:

✓ $34 and $126 in Salt Lake City
✓ $88 and $332 in Detroit
✓ $39 and $137 in Wichita
✓ $190 and $478 in Miami
✓ $65 and $209 in Montpelier
✓ $178 and $430 in Los Angeles
✓ $42 and $262 in Nashville

In addition, most companies give a 15-per-cent discount for an experienced rider—someone who's either taken a rider training program or ridden without claims for a year. You should also get 10 per cent off if you insure two or more bikes at once. On the other hand, rates are usually higher for younger riders, in a graduated scale from 17 and under, 18 to 22, 23 to 28, and 29 years old and over. And most companies won't insure choppers, race bikes, trikes, parade bikes or ones used for business.

Types of Coverage

Liability: The basic motorcycle policy pays up to $20,000 in medical payments if you run into one person, up to $40,000 for more than one person, and up to $5000 for damage to another vehicle or to other property.

Uninsured Motorists: Pays the same limits as a bodily injury liability policy if the other driver is the one at fault but he doesn't have insurance.

Guest Passenger: Usually pays up to $40,000 for medical expenses if your passenger is injured.

Medical Payments: Some companies offer a token $1000 policy to cover bodily injuries to the rider. This is rare, however, and not worth much if you're already covered by a Blue Cross plan.

Comprehensive: Covers your motorcycle against fire, theft and vandalism and depends on the value of the bike. Most companies are charging a $100 deductible on coverage, and many companies won't offer comprehensive coverage on a motorcycle bigger than 850cc or newer than two years old.

Collision: Pays for damage to your bike when you throw it down the road. Again, usually a $100 or $200 deductible, available only on bikes under 850cc.

Accessories: Fairings, sissy bars and similar accessories aren't covered by normal policies, since they're so easily ripped off. Special accessory policies are very expensive; the premium is usually 20 per cent of the value of the accessories, which means the insurance company expects one out of every five accessories to be stolen or damaged, or all of them to be stolen or damaged every five years.

Sunny-Day Discounts: On six-month or nine-month policies, you're covered for occasional use during the winter.

Buying Insurance

Insurance rates *are* different for the same coverage within your area, depending on the company. When you compare, however, make sure you're comparing apples to apples. Don't worry about the financial stability of your insurance company. If they're doing business in the state, they meet at least minimum standards, and every state has an insurance fund to which every company is forced to contribute. These mandatory donations are used to cover claims against companies which have gone out of business, and the state government guarantees to back all claims. It could take you years to get paid off, however, if your company does go under.

—Rich Taylor

Z-1000.
Still the one.

It gets to you. The Z.

The embodiment of everything you've dreamed about in motorcycling.

An engine that's pure muscle mass. Horsepower that works out to a power-to-weight ratio of only 6.4 lbs. of motorcycle per hp. If you're up to it, the Z will do it. That's the Z.

And that's the premise on which we build all Kawasaki motorcycles. A total commitment to never ending engineering improvements. So you can spend more time on good time motorcycling.

The outcome of that thinking has made the Z-1000 easy to ride. It feels solid. Nimble but smooth in tight corners at slow speeds. And completely predictable when you roll on the throttle.

There's nothing like the experience of riding a Z. You just can't help but love it.

It's still the one. Now and to come.

Kawasaki

We know why you ride.

KAWASAKI BELIEVES IN RIDING SAFELY. CHECK LOCAL LAWS BEFORE YOU RIDE.

CIRCLE NO. 39 ON READER SERVICE PAGE.

CYCLE DIRT TEST

SUZUKI PE175

Suzuki engineers reached into their parts inventory, mixed and matched pieces from three RM125 models, made appropriate modifications, and thus created the impressive new PE175.

● DURING THE FIRST SIX MONTHS OF 1978, Suzuki PE175 riders successfully assaulted the lightweight class in both local and national enduros and in all five ISDT Two-Day Qualifiers. One rider in particular, Drew Smith, racked up an impressive list of wins. He topped the 175 class in the Alabama, Fort Hood, Michigan and Oregon Two-Day events. Additionally, fellow Team Suzuki riders Don Cichocki and Mike Rosso made it a PE one-two-three sweep of the 175 class at Fort Hood. Not content with class wins, Smith humbled the 250 and 400 riders by reeling in the overall victory at the Burr Oak National Enduro and the Oregon City National in May. Clearly, the PE175 has now been recognized as a machine for competitors with serious intentions to win.

Designers saw a potential market composed of dedicated novice enduroists as well as experts, and Suzuki worked to satisfy all levels of riders. The company, trying to build a multi-level bike, has produced a machine which accommodates beginners and intermediates, and the 175 has come within a couple of horsepower of producing a bike which meets the requirements of aspiring ISDT contenders. For experts, the stock 175 is a bit down in power compared to its box-stock competitor, the Yamaha IT175. However, after watching some of the Team Suzuki riders in action and considering their extraordinary success, we think the PE not only has the potential to be *really* fast, but also that a few individual 175s have already been modified to that level.

Four primary factors contributed to the 175's success, real and potential. First, Suzuki designers began with a solid basis

PHOTOGRAPHY: DON PHILLIPSON

for development: the RM125. For four years the RM has been either the best, or near the best, 125 motocrosser available. And it's no secret that, with just a few exceptions, the major components which make a good motocross bike also make a good enduro bike.

The PE uses parts and designs from the A-, B- and C-model RM125s, including (in modified form) the RM top end, engine cases, transmission and chassis. Developers of the PE did not make the enduro model a direct extension of the RM-C, which theoretically is the most advanced machine, for two reasons. First, though the latest motocrosser is extensively refined, its major components also have their roots in the RM-A. Moreover, most of the C-model's modifications have more exactly defined its role as a motocrosser. Consequently the developers chose the most suitable parts from all RM models in order to assemble an enduro bike.

All the RMs and the PE use the same basic cylinder and head design. The sand-cast cylinder has an iron liner with a bridged intake port, six transfer ports (two of which are debatably functional boost ports) and a large bridged exhaust port. Unfortunately, the cylinder's quality of construction is only average. In the past, Suzukis have had especially high-quality cylinder construction, but the PE cylinder has many jagged port edges and rough port linings; all of this hinders the flow of gas. A two-petal reed valve combines with the piston port induction system to form the hybrid case-reed design. Because the PE has a 57mm stroke and the RM has a 54mm stroke, the port heights are necessarily different. However, the PE's port angles have been intentionally altered to give the 175 a wider power band and more torque.

The cylinder head does not use a squish band for one major reason. In a 175cc engine, the benefit of a band—concentration of the charge to eliminate detonation—comes only with nearly exact machining tolerances, and in mass-produced engines such exactness is rare. And there's nothing really unusual about the piston either. The piston uses two standard rectangular-construction rings. The piston also has a long piston skirt, made possible by the use of the case-reed valve. The long skirt aids reliability by offering large piston-surface contact area, thus reducing the rocking motion of the piston and eliminating a minor degree of wear.

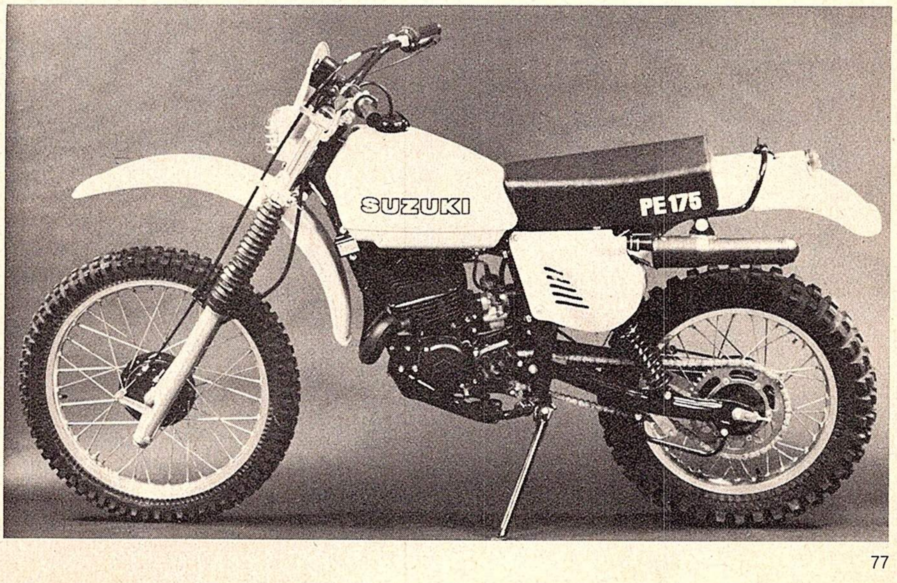
Other PE top-end parts are larger to handle the extra power: the connecting rod is stronger; there's a 22mm crank pin compared to the RM's 19mm pin, a larger big-end bearing, and a 16mm wrist pin compared to the RM's 14mm pin.

The PE's induction system is a good example of the designers selectively choosing components from various RM models. Thanks to its modified reed valves, the 1977 RM-B engine was torquier in the mid-range than the A-model. The PE has the B's reeds, which help to produce power more suitable to enduro riding. Both the PE and the RM-C have 32mm carbs which feed the gas/air mixture to the two-petal reed valves.

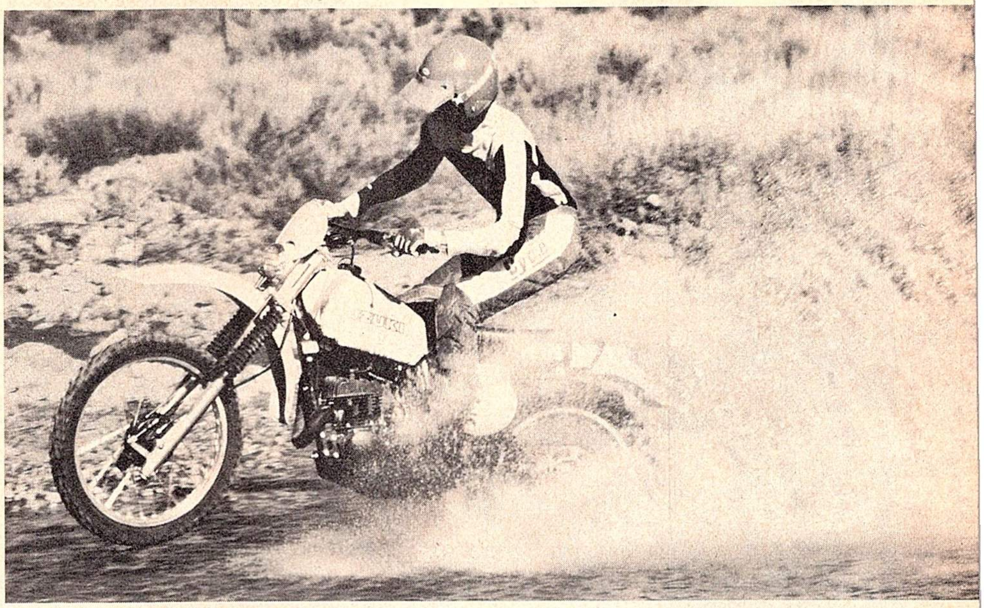
The PE engine uses slightly modified RM cases: the 175 has wider transfer-port recesses, and—though both use six cylinder studs—they have slightly different stud patterns. Internally, the PE differs from the RM primarily in its gear ratios, which are wider for enduro work. Comparatively, the PE's and RM's ratios are:

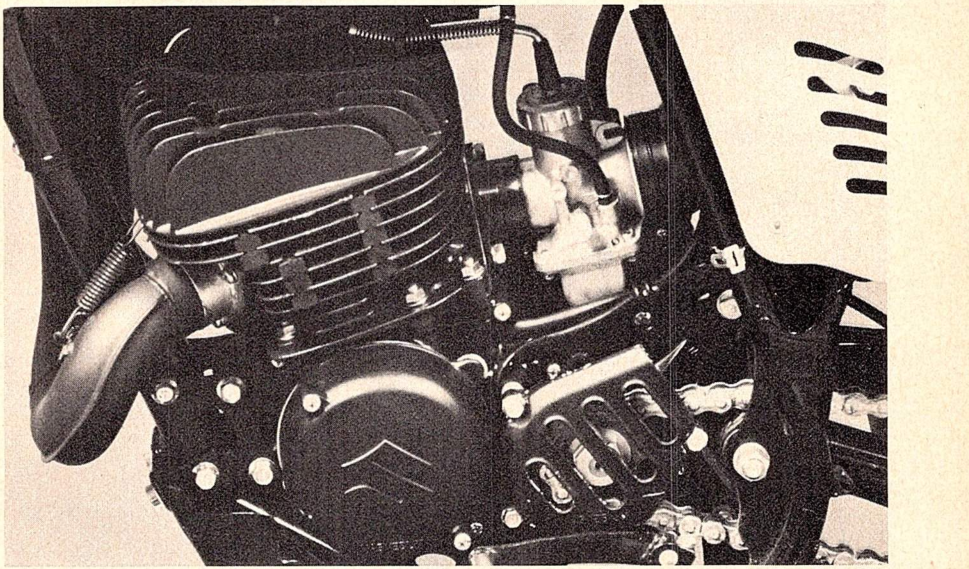
	PE	RM
1st	34/11	28/12
2nd	31/14	28/16
3rd	28/17	24/17
4th	25/20	25/21
5th	23/22	23/22
6th	21/24	22/23

The two bikes share the fourth and fifth driven gears, and the third and fifth drive gears. Furthermore, both machines have the same drive shaft and share all bearings. The countershafts on both bikes are



SUZUKI





Manufactured strictly for enduro work, the 175 is easily modified to produce more power for Two-Day riding.

dimensionally identical; however, because the first gears are in unit with the countershafts, the parts are not interchangeable. Except for two extra plates, the PE's clutch is identical to the RM's.

Both bikes use Suzuki's Pointless Electronic Ignition. Though the RM uses an internal rotor flywheel, the PE uses a heavier external rotor to generate more flywheel inertia and consequently provide more low-end pulling power.

Research and development men returned to the RM-A for the PE's basic chassis dimensions. The two bikes share a 30-degree head angle, 130mm trail and overall basic design. The PE differs only by virtue of a rear fender loop and a few extra tabs to accommodate specific enduro items such as a large silencer/spark arrestor. The PE does not use the RM-C's frame dimensions because the new motocrosser has a steeper head angle and less trail, features which produce quicker steering but also detract slightly from high-speed stability. Two significant dimensions of the RM-C and PE swing arms are the same: the center-to-center distance from the swing-arm pivot to the shock mount is 327mm (12.8 inches) and the distance from the swing-arm pivot to the rear-axle slot is 505mm (19.8 inches). Swing-arm bearings (and steering-head bearings) used in the RM-C and PE are identical; however, the motocrosser's swing arm is larger in diameter.

There are substantial differences in suspension between the motocrosser and the enduro bike. Though both machines have the same wheel travel—230mm (9.1 inches) and 224mm (9.0 inches), front and rear—the PE uses a KYB oil/spring fork while the RM uses an air/oil design, and the 175 uses fully contained DeCarbon-design, KYB gas/oil shocks in place of the 125's remote-reservoir units.

The PE175 owes part of its success as a highly functional first-year model to its excellent foundation in the Suzuki part bins. But the PE250 also had an excellent base—the RM250—and, comparatively speaking, the 250 enduro was not as first-rate an effort as the 175 is. And this leads to the second factor behind the 175's success: Suzuki's experience with the PE250 paved the way for more efficient development of the smaller bike. The people involved with making the 250 race-ready were the same people responsible for the prototype testing of the 175, and the man in charge of the effort was Team Suzuki racing manager John Morgan.

Morgan directs the efforts of the 175 and 250 riders contesting both the National Championship Enduro series and the Two-Day Qualifying rounds. For three years, he worked on making the PE250 competitive, and in the process he gained a lot of practical knowledge. He applied this experience to the development of the 175, which was tested in its pre-production stages by Drew Smith, Herluf Johnson and Mike Halpin, in Massachusetts and New Jersey.

But there's more to the production of a competitive machine than the success of a prototype. Often, a pre-production bike has items which never see the light of a production day. John Morgan was adamant that most of the prototype's high-quality and effective items made it into production. In short, he insisted the bike be right or not at all.

The 175's foundation, Suzuki's experience with the 250, the 175's pre-production race-testing and John Morgan's commitment to the product resulted in a machine which performs particularly well.

Generally, the PE's power characteristics can be typified as genial and smooth. In any type of riding, the engine has an abundance of torque and builds revs slowly and predictably. While trail riding, especially on tight, low-speed trails with logs or switchbacks, the rider appreciates the gradual rise in power. The rear wheel never breaks loose unless the rider wants it to, and this results in a precise, controllable ride. On faster trails, the rider must keep the PE well into its powerband and keep the gear shift lever moving to maintain a higher speed average. If the rider is lazy and doesn't shift, the PE is not quick to regain revs and consequently speed. *Cycle* test riders found that particularly in cross-country and desert riding, where the speeds are generally faster than in a timed event, it was necessary to keep the 175 revving high.

Other aspects of the powerplant's performance were first-rate. Carburetion was nearly spot-on, with the mid-range running just a bit rich. Gearbox and clutch action is likewise excellent. When you need to hustle you can shift through gears full throttle.

Anticipating the question of any serious 175cc enduro, two-day or cross-country rider, we match-raced the PE175 against the Yamaha IT175. In a straight-line drag

race, the IT consistently pulled the PE by five to seven bike lengths by the time both bikes peaked in sixth gear. Even with different riders on board, the results were the same. The Yamaha was significantly stronger in third, fourth and fifth gears, and both bikes stayed dead even in sixth, each having the same top speed. In all fairness, it must be said that enduro bikes are not meant to be drag racers, but this run-off brought out a couple of salient facts. First, a stronger mid-range charge would undoubtedly make the PE more competitive with the IT and would make the PE more enjoyable for both enduro and cross-country riders. The problem is getting that power; certainly spot-on needle jetting would produce a sharper midrange throttle response.

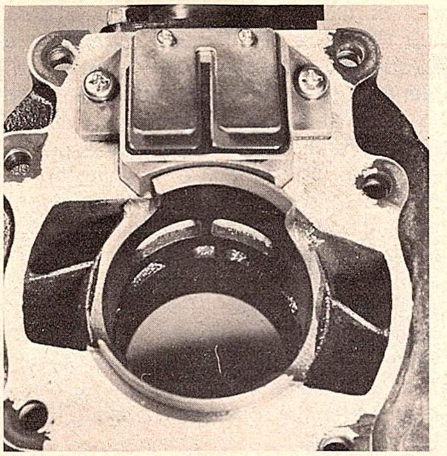
The PE/IT comparison likewise suggested that the Team Suzuki bikes have been tweaked for a bit more power. Machines with horsepower deficits don't win National Enduros overall, even with an excellent rider aboard. We tore down our test bike to see what modifications an owner could easily make and to surmise what the factory may have done to its team bikes. Just polishing and matching the rough ports would certainly improve the gas flow and unleash some power. Further, the cylinder head uses a 0.5mm gasket; replacing it with a 0.3mm gasket would raise the compression slightly and boost the power. Some field experience indicates that this particular engine will stand a bit more timing (18 to 20 degrees BTC) to preserve good low-end power.

The PE, moreover, is super-quiet: stock, it registers a mere 84dB(A). If the bike were to be used strictly in closed-course competition, some power could be gained by reducing the exhaust restriction. With clean ports, slightly higher compression, advanced timing and better exhaust breathing—simple and nearly cost-free modifications—the PE would undoubtedly be among the fastest 175s available. And with that kind of performance, a PE175 owner might have a machine capable of winning an ISDT Qualifier or a National Enduro.

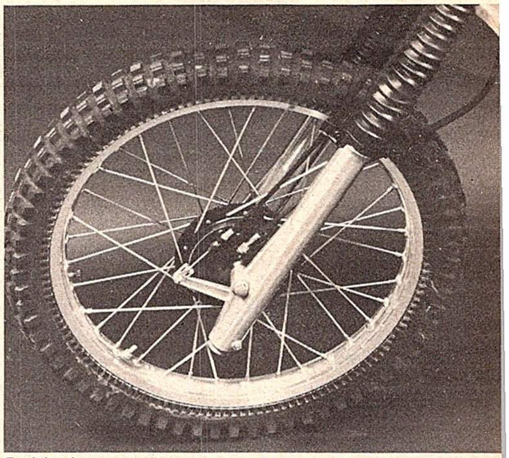
In all types of terrain, the PE's frame geometry and construction result in high-speed stability and overall excellent handling. A 55.9-inch wheelbase, 239-pound wet weight and proper weight bias allow the PE to forge through whoops straight-and-true and wind precisely along high-speed, twisty trails. A 30-degree head angle, which the PE has, theoretically results in neutral steering response, but other dimensions—primarily trail and wheelbase—also affect response. The 175 turns relatively quickly and oversteers just slightly in tight woods. If the rider uses some throttle and body English though, the PE is overall very nimble.

The PE's tractability over rough ground compensated for its peak-horsepower disadvantage compared to an IT175.

Muffler is very quiet but restrictive; heavy-duty rock guard protects chain, tensioner and sprocket.



Cleaning the ports would improve the gas flow and boost power at all rpm; case-reed valves help low-end.



Fork had progressive response; Metzeler tires, though not absolutely necessary, would provide more traction.

Make and model	Suzuki PE175
Price, suggested retail	$1149

ENGINE

Type	Two-stroke, single-cylinder, air-cooled, piston-port and case-reed induction
Bore and stroke	62.0 x 57.0mm (2.44 in. x 2.24 in.)
Piston displacement	172cc (10.5 cu. in.)
Compression ratio	7.6:1 (trapped)
Carburetion	(1) 32mm slide-throttle Mikuni
Exhaust system	Upswept pipe with silencer/spark arrestor
Ignition	Capacitor discharge, reverse-voltage triggered, magneto
Air filtration	Oiled foam, washable
Bhp @ rpm	17.82 @ 9000
Torque @ rpm	11.00 @ 7500

TRANSMISSION

Type	Six-speed, constant-mesh, wet-plate clutch
Primary drive	Gear, 58/21, 2.761
Final drive	520 chain, 48/12 sprockets, 4.000:1
Gear ratios, overall	(1) 34/11 (2) 31/14 (3) 28/17 (4) 25/20 (5) 23/22 (6) 21/24

CHASSIS

Type	Single-downtube, full-cradle frame; leading-axle fork, swing-arm suspension
Wheelbase	1420mm (55.9 in.)
Rake/trail	30°/130mm (5.12 in.)
Brake and hub, front	Cable-actuated, double-shoe drum
rear	Cable-actuated, double-shoe drum
Wheel, front	Takasago, one rim-lock rim
rear	Takasago, two rim-lock rim
Tire, front	IRC 3.00 x 21 in. Volcanduro knobby; 4 pr
rear	IRC 4.00 x 18 in. Volcanduro knobby; 4 pr
Seat height	914mm (36.6 in.)
Ground clearance	291mm (11.5 in.)
Fuel capacity	12 lit. (3.2 gal.)/2 lit. (0.53 gal.)
Curb weight, full tank	108 kg (238 lbs.)
Test weight	185 kg (408 lbs.)

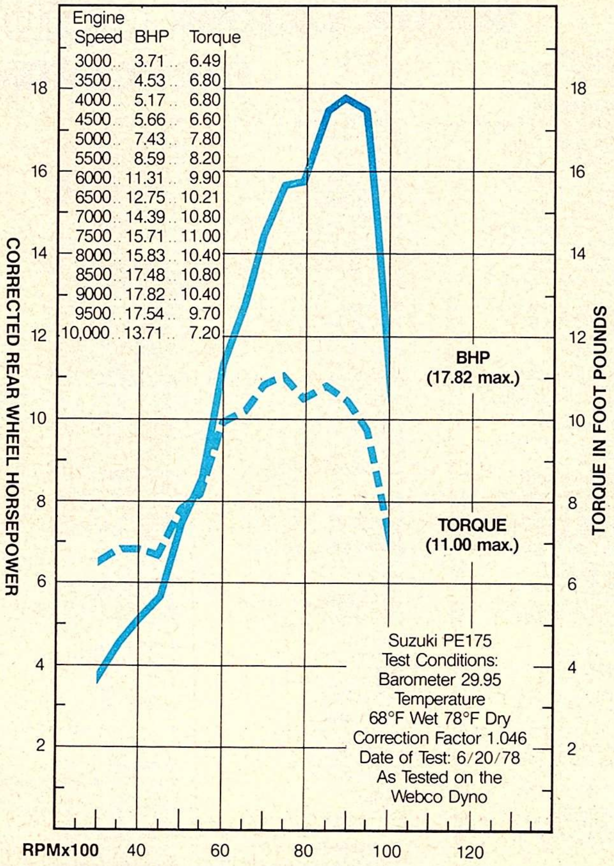
ELECTRICAL

Power source	Flywheel magneto
Headlight beams, high/low	15W/15W
Tail/stop lights	5W/no stop light

INSTRUMENTS

Includes	resettable odometer

CUSTOMER SERVICE CONTACT
Customer Relations Department
U.S. Suzuki Motor Corp.
13767 Freeway Drive
Santa Fe Springs CA 90670
(213) 921-4461



Engine Speed	BHP	Torque
3000	3.71	6.49
3500	4.53	6.80
4000	5.17	6.80
4500	5.66	6.60
5000	7.43	7.80
5500	8.59	8.20
6000	11.31	9.90
6500	12.75	10.21
7000	14.39	10.80
7500	15.71	11.00
8000	15.83	10.40
8500	17.48	10.80
9000	17.82	10.40
9500	17.54	9.70
10,000	13.71	7.20

Suzuki PE175
Test Conditions:
Barometer 29.95
Temperature
68°F Wet 78°F Dry
Correction Factor 1.046
Date of Test: 6/20/78
As Tested on the
Webco Dyno

SUZUKI PE175 .... *Continued from page 80*

Though nothing trick, the front and rear suspension units do a good job of handling the terrain. Most of all, the PE's ride is plush. The suspension is set up a bit soft for typical hours-long enduro work, and the resulting comfort is pleasing. Especially commendable is the fork's smooth, progressive and fade-free damping action. The fork comes stock with 10-weight KYB fork oil, which worked well in all of the test riding. The front fork has sufficiently stiff springs to avoid bottoming, yet the initial spring response allows the fork to respond quickly to small and intermediate bumps. With three pre-load positions, the gas/oil shocks performed acceptably well. For a 170-pound rider, the shocks were a bit soft and bottomed often, especially over high-speed whoops. Adjusting the pre-load (a time-consuming procedure) helped, but the shocks are better for comfort than for high-speed handling.

The PE's wheel assemblies roll on IRC tires which provide good traction for a generally dry climate. The Takasago rims held their spoke adjustment and did not ding even though we rode through many rocky areas. At the Two-Day qualifiers most of the PE riders showed up with Metzeler or Hi-Point tires wrapped around Sun rims, but the change is unnecessary.

Both front and rear cable-actuated brakes stopped the bike quickly and progressively. Unlike the RM-C's full-floating design, the PE's rear brake set-up (from the RM-B) is non-floating; the brake's torque arm attaches to the swing arm. Generally, a full-floating brake is superior to a conventional setup. When a full-floating brake is activated, pressure is exerted on the torque arm, which transfers that load to the chassis. When a non-floating brake is activated, the torque arm feeds the load into the swing arm; the swing arm is pushed down at the pivot and up at the axle. This action compresses the rear suspension and results in wheel hop under hard braking. A full-floating brake goes a long way to eliminate the hop by routing the braking loads to the chassis.

However, there's no free lunch: the RM's torque-arm bracket extends downward from the backing plate, a position fine for motocross but vulnerable to rocks in an enduro situation. The bracket's positioning on the PE is not required by any mechanical principle; the bracket is simply an RM/PE shared component, because it would be far more costly to build an entirely different free-floating arrangement for the PE.

Overall fit and feel of the PE is excellent: the 175 feels like a big bike. The seating position is natural and comfortable, though the rear fender can be felt occasionally through the seat's foam. Handlebar positioning is somewhat forward, with the bar mounted directly above the triple clamps in contrast to the RM's rear-set bar. The rider finds himself in a comfortable, serious, go-fast crouch. But when just plonking along and standing straight up, the shocks will chafe at the rider's legs. The 13.5-inch-high pegs provided good ground clearance for *Cycle*'s test riders. However, some of the factory riders have mounted PE250 pegs which give an extra three-quarters of an inch clearance. An extra rock and brush guard for the chain extends down from the swing arm, protecting the lower and forward portion of the rear sprocket. An RM-type chain tensioner functioned well.

There is a clever combination tool that attaches to the right side of the triple clamps. It has 12, 17 and 24mm box sections, which fit the spark plug, chain adjusters and front and rear axles.

A large, accessible foam air cleaner rests in the air box below the seat. The top of the box attaches via two clips, and the breather hole is the only place water can enter the induction system. Though test riders crossed a two-foot deep stream again and again, waterlogging did not pose a problem.

When designers of the PE were still developing the bike, they asked for quick-release axles and sprockets. Because the bike is intended to be a pure enduro machine rather than an ISDT bike, those features never reached production. Suzuki also wanted a folding brake lever and gear shift lever, but Yamaha holds the

(Continued on page 122)

SEE THE EXCITING MOTO GUZZI LINE AT THESE PARTICIPATING DEALERS.

ARIZONA
SCOTTSDALE/Motorcycle City
2608 North Scottsdale Road

CALIFORNIA
GLENDALE/Woods Motor Shop
525 W. Colorado St.
LONG BEACH/Long Beach
Moto Guzzi-Ducati
624 W. Pacific Coast Hwy
NATIONAL CITY/Sonny Angel
Motorcycles. Inc.
34 East 18th Street
OAKLAND/Schleicher Motors
7954-56 MacArthur Boulevard
SACRAMENTO/Hall-Burdette
2010 Del Paso Blvd.
SAN BERNARDINO/Bills Cycle
824 N. Waterman
SAN FRANCISCO/Munroe Motors
Triumph Moto Guzzi
Motorcycle Sales & Service
412 Valencia St.
SANTA CLARA/Cycle Sports
2355 El Camino Real
VALLEJO/Ted Phelps Motorcycles
1639 Sears Pt. Rd. (Hwy. 37)

COLORADO
DENVER/Harry's Motors. Inc.
965 Santa Fe

CONNECTICUT
NORWALK/Ham's Motorcycle Shop. Inc.
59 Fort Point Street
WAREHOUSE POINT/Marsh Motorcycle Co.
36 North Road
WEST HARTFORD/New England
Cycle Sales Inc.
544 New Park Ave.
WINSTED/Cycle Therapy
R.F.D. #4 Rt. 8
SOUTHINGTON/Schuster's Cycle Sales
Pratt St.

FLORIDA
BROOKSVILLE/Amsler Motors Corp.
1040 US 98 North
DAYTONA/Jeff's Cycle Service
2600 South Nova Road
FT. MYERS/Carwana Moto
Guzzi Sales & Service
2827 Palm Beach Blvd.
SARASOTA/Big Ben Moto
Guzzi Sales & Service
1701 N. Lime Ave. & 17th St.

GEORGIA
ATHENS/Cycle Specialties of Athens
220 Oak St.

ILLINOIS
BELVIDERE/The Dyno Shop
1007 Logan Ave.
CHICAGO/Dolezal Bros.
1637 Blue Island Ave.
CHICAGO/Midwest Motorcycle Imports
4301 W. North Ave.
HARVEY/Harvey Cycle
& Camper. Inc.
14755 Halsted St.
LOCKPORT/Larry's Cycle Sales
Rt. 171 & Smith Rd.
NAPERVILLE/The Starting Line Inc.
25 W 223 Ogden Ave.
PALATINE/Power Motors
1900 N. Rand Rd. (Rt. 12)
ROCK ISLAND/Dale's Cycle Shop
2024 — 4 Ave.

INDIANA
DECATUR/Drake Cycle Shop
RR 5
ELKHART/Collins Cycle Sales
56173 Rt. 7 CR 13S
INDIANAPOLIS/England Cycle Inc.
3562 West 10th St.
MUNCIE/City Cycle —
Moto Guzzi Sales
2305 E. 29th
TELL CITY/Brown's Motorcycle Sales
Brushy Fork Road
WOLCOTT/Milligan Cycle Shop
RR1 — Box 171

IOWA
DES MOINES/Ozzie's Cycle Sales
4770 NE 29th
IOWA CITY/European Motorcycles Ltd
Highway 1 West
KEOKUK/Irvin Cycle Sales
1128 Main
WATERLOO/Webers Cycle Center Inc.
735 Ansborough

KANSAS
DESOTO/Penners Cycle Barn
Box 495
WICHITA/#1 Cycles of Wichita
339 North West Street

LOUISIANA
GRETNA/Vernon's Cycle Shop
1131 Huey P. Long Ave.
SLIDELL/Southside Cycles
757 Old Spanish Trl.

MAINE
AUGUSTA/Suzuki North
133 Mount Vernon Avenue

MARYLAND
ABINGDON/Jager Bros. Enterprises. Ltd.
3911 Pulaski Highway
BALTIMORE/Baltimore Cycles
6020 Eastern Ave.
BRUNSWICK/Halley Motorcycle Sales
1001 Petersville Road

MASSACHUSETTS
BEVERLY/Freeman Cycle Inc
50 Federal St.
EVERETT/Parkway Cycles
— Moto Guzzi
1865 Revere Beach Parkway
HYDE PARK/Metropolitan Motors
1661 Hyde Park Avenue
MILLIS/Millis Cycle
Rte 109
NEWTON/Farco's
Moto Guzzi Sales
320 Watertown St
PITTSFIELD/Bellstone Cycle
1608 W. Housatonic St. Rte 20
SOMERVILLE/Riverside
Motorcycles
290 Somerville Ave.
STURBRIDGE/Roland's Cycle
Scooter Shop
Wallace Road

MICHIGAN
DETROIT/Blackie's Custom
M/C Engs. Inc
10610 Joy Rd.
FLINT/Flint Indian Sales
923 N. Saginaw
LANSING/GT Motors
816 E. Howe Ave.
MIDLAND/Midland Cycle Sales
5996 N. Jefferson Rd.
MUSKEGON/Snell Motorcycle Sales
590 Ottawa St.

MINNESOTA
BLOOMINGTON/Leo's Motorcycle
Sales Inc.
9521 Garfield Ave. S.
FRONTENAC/Frontenac Cycle Sales
Box 41. Hwys 61-63
WINTHROP/Petersen Outdoor Equip.
303 W 2nd

MISSOURI
KANSAS CITY/Northland Moto Guzzi
303 N.E. 72nd
RAYTOWN/Raytown Cycle Center
6324 Overton
ST. LOUIS/Donnelson Cycles Inc.
3328 Woodson Rd.
ST. LOUIS/Motorsport
6115 Gravois Avenue
SPRINGFIELD/Road & Track Cycle Sales. Inc.
600 College

MONTANA
GREAT FALLS/Tony's Cycle Center
1101 Smelter Ave.

NEVADA
HENDERSON/Bess Bros. Cycle Shop
1605 Palm St.

NEW HAMPSHIRE
MANCHESTER/Fitzgerald Cycle. Inc.
782 Gold St
NASHUA/Anderson Sports Center Inc.
16 Progress Avenue

NEW JERSEY
DOVER/Competition Cycle Inc.
249 E. Blackwell St.
JOBSTOWN/Macho Touring Cycles. Inc
Route 537
VINELAND/Cycle Sport Center
South Delsea Drive
WAYNE/The Sport Spot
168 Hamburg Tpke.
WESTWOOD/Westwood Suzuki Inc
701 Broadway

NEW MEXICO
ALBUQUERQUE/Rissmann Motors
& Cycles. Inc.
8414 — 4th St. NW

NEW YORK
ALBION/Ace Cycle Sales
13935 West Lee Rd.
ALEXANDER/Sunnyside Cycle Sales Inc.
Main St.
BALLSTON SPA/Helman's Garage
17 Washington St
BLOOMINGBURG/Paul's Cycle Shop
R.D. 1. Box 101
BROOKLYN/The King
Motorcycle Corp
657 Utica Ave.
BUFFALO/Empire Cycle
2928 Southwestern Blvd.
U.S. Route 20
DELMAR/Chuck Long Enterprises
C and C Cycle.
154B Delaware Ave.
OWEGO/Cycles of Fifth Avenue
Box 8. Fifth Avenue
PORT WASHINGTON/Ghost Motorcycle Sales
194 Main St.
ROCHESTER/Suzuki of Rochester. Inc.
1180 Scottsville Rd.
SIDNEY/Higgins Motor Sales
Rte 7. Box 565

NORTH CAROLINA
HIGH POINT/G & H Cycle Sales
1313 N. Main St.
BLACK MOUNTAIN/Osteens' Cycles Inc.
US 70 East

OHIO
ASHLAND/Pifer's Cycle Sales
1602 Cottage St.
GENEVA/The Motorcycle Shop
4730 N. Ridge East
HUNTSBURG/The Bike Barn
Harley-Davidson Sales
12381 Madison Rd.
MANSFIELD/United Motor Sales
1092 W. Fourth St.
NAVARRE/Mathias Sports Center
6421 Navarre Road S.W.
NORTH LIMA/Moto Guzzi Hangar
113 E. South Range Rd.
ROSSBURG/Lightsville Garage
12700 Route 49 No.
SALINEVILLE/Eish Enterprises
Route 3
SWANTON/WalFam. Inc.
Motor Sports Sales
12146 Airport Highway

OKLAHOMA
OKLAHOMA CITY/Cal's
Motorcycle Sales Inc.
701 S.E. 29
TULSA/Atlas Cycle Sales
6708 E. 11th St.

OREGON
ALBANY/Two Wheel Horse
956 So. Geary St.
MILTON-FREEWATER/SuperBike
Moto Guzzi-Ducati
8 N.E. 7th
PORTLAND/Portland Motorcycle Co.
Suzuki-Moto Guzzi-Ducati
933 N.E. 82nd

PENNSYLVANIA
AQUACHICOLA/Hunsicker's
Moto Guzzi Sales
P.O. Box 11
BATH/Bath Hardware & Cycle
121-25 Walnut Street
BRADFORD/Pete's Cycle Shop
18 Corwin Lane
GREENSBURG/Westmoreland
Moto Guzzi Sales
RD #5
HARRISBURG/Jack Harman
Motorcycle Shop
808 Parkway Dr.
PLEASANT VALLEY/Albert Sigmans
Rt. 212
READING/Fritz's
236 N. 9th St.
WILKES-BARRE/Iron Horse. Ltd.
Wilkes-Plaza — Rt. 309

RHODE ISLAND
NEWPORT/Newport Yamaha
134 Broadway

TEXAS
AUSTIN/Haufler Cycle Center
4312 Gillis
FT. WORTH/Mark I Motorcycles. Inc.
623 N. Chandler
GRAND PRAIRIE/Storm's Cycle
3000 E. Jefferson
HOUSTON/Motorcycle Sales Service
2108 Leeland Ave.
MIDLAND/Moto Guzzi Sales
1505 W. Industrial
ODESSA/Wilson's Motorcycles
2614 Kermit Hwy.
RICHARDSON/Dallas
Motorcycle Sales Inc.
410 N. Central Expressway
SAN ANTONIO/Krumm's Cycle Shop
2307 Bandera Rd.
UNIVERSAL CITY/Yamaha City
1737 Pat Booker

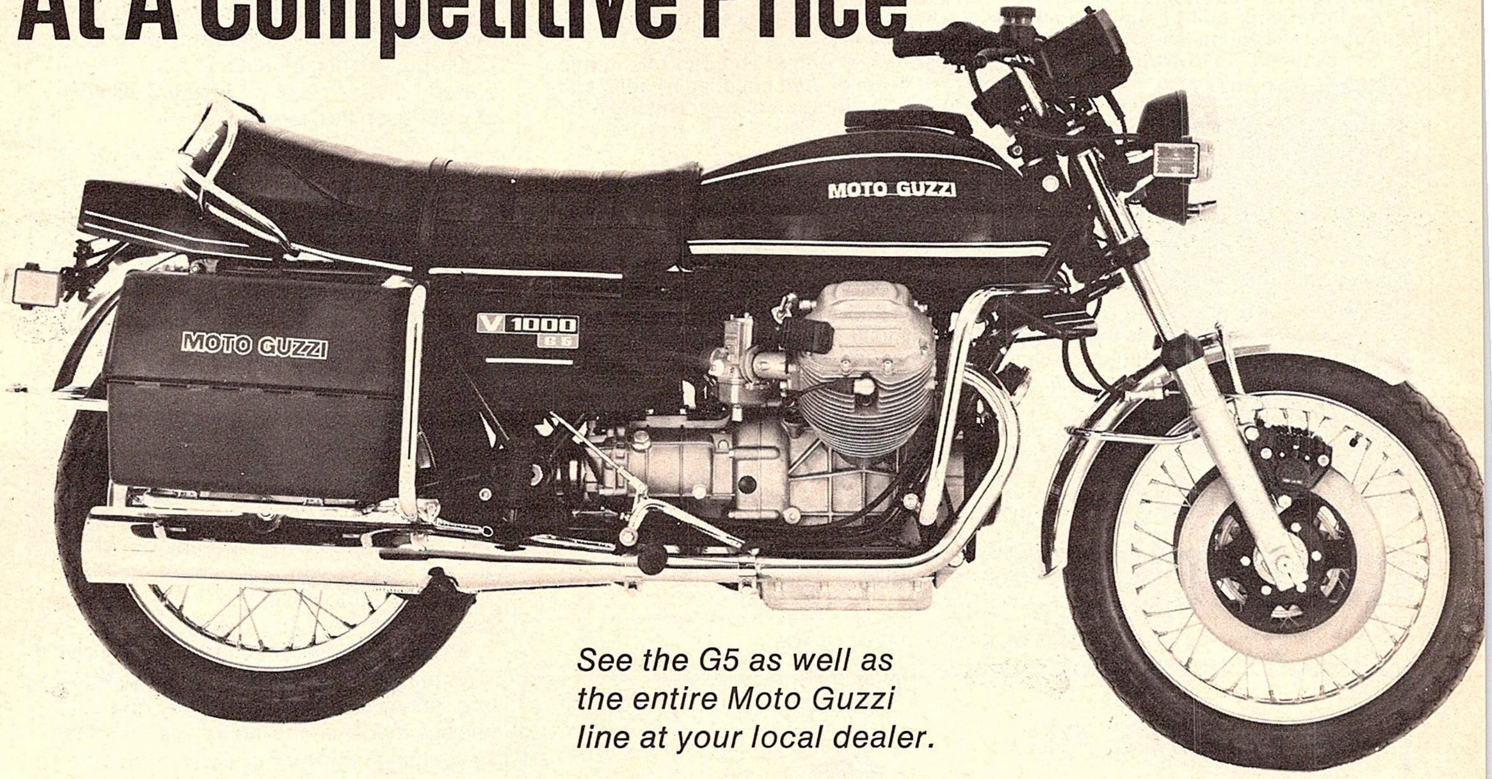
VERMONT
BENNINGTON/Tri State
Motorcycle Center
125 Northside Drive
NO. CLARENDON/Bridgestone S.&S.
Airport Road
PLAINFIELD/Just Imports
Rt 2
SPRINGFIELD/Eureka Triumph
& Moto Guzzi Sales
& Service
Eureka Rd.

WASHINGTON
SEATTLE/Drager's Motorcycle
1207 Dexter Avenue North
SPOKANE/German Auto Service
E. 3335 Trent Ave.

WISCONSIN
ALLENTON/Vern's Kawasaki
Hwy 33 & WW
CUBA CITY/Jim's Cycle Sales
317 N. Main
MADISON/Decker H-D Sales. Inc.
2613 S. Stoughton Rd.
MILWAUKEE/American R.V.S.. Inc.
1700 East North Avenue
TOMAH/Larry's Power Center
Highway 12-16 East

You Can Now Own This Exciting New Machine At A Competitive Price

MOTO GUZZI
1000
G5

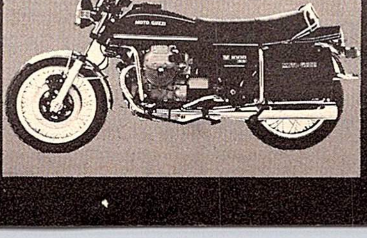


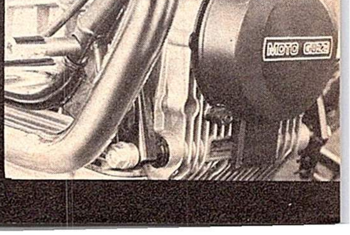
See the G5 as well as the entire Moto Guzzi line at your local dealer.

Before you buy any other machine, you owe it to yourself to check out MOTO GUZZI . . . facts speak for themselves. MOTO GUZZI has been designing and producing high quality motorcycles since 1921 and has over a half century of experience in manufacturing two-wheeled vehicles. MOTO GUZZI offers an extensive list of technical advances, such as, the patented integral brake system to insure maximum safety, a reliable alloy V-twin power plant that has proven itself in the most strenuous and punishing long distance endurance tests, a race-proven frame design for optimum handling and cornering, one piece steel crankshaft of rugged construction to insure dependability, maintenance free shaft drive five speed transmission. Factory recommended spare parts readily available through dealers from coast to coast.

PREMIER Motor Corp. an organization that offers over 45 years of motorcycle experience.
Hasbrouck Heights, N.J. 07604

CIRCLE NO. 21 ON READER SERVICE PAGE.





A POINTLESS IMPROVEMENT!
High Performance Electronic Ignition

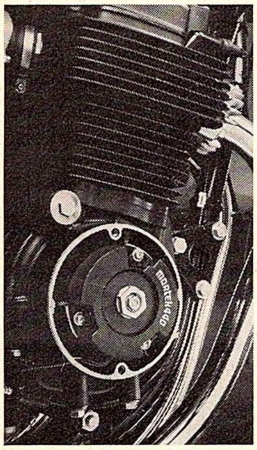
THE MARTEK 440 HIGH PERFORMANCE ELECTRONIC IGNITION systems yield maximum engine power through greater high speed spark energy. Plus, they provide precise, adjustment-free ignition timing regardless of how many miles you ride your motorcycle.

The **Martek 440 Series** is completely self contained and so compact ***it actually fits behind the point cover.*** Installs in less time than it takes to adjust points!

The special one-piece timing rotor fits on the original factory spark advancer to insure optimum starting and idling performance.

By increasing coil charging time, the Martek 440 guarantees high performance ignition at the engine's fastest potential running speed.

The system's ***solid state circuitry eliminates breaker points*** and controls ignition timing with an ***infra-red beam of light*** supplied by ***solid state light emitting diodes (LED).*** Vibration or wear will not affect the system.



THE 440 SERIES:
440 For Honda 750, 550, 400 and Kawasaki 650 Fours
440K For Kawasaki 900 and 1000 Fours
440S For Suzuki 550, 750, and 1000 Fours
THE 1000 SERIES:
1000 For Honda GL 1000 Goldwing
1000HD For Harley Davidson 1000 and 1200 V-Twins

This ALL NEW model has the same performance features as the 440. The **MARTEK 1000** "Hall Effect" electronic timing module is easily installed in place of and completely eliminates the breaker points.

■ Maximum engine power ■ Greater high speed spark energy
■ Precise, adjustment-free ignition timing
■ Easy installation ■ Easy, reliable starting
■ Smoother engine performance at all speeds
■ Full year guarantee . . . $98.95 for 440 and 1000 Series . . . $109.95 for 1000 HD.

MARTEK Products, Inc.
3609 W. MacArthur Blvd.
Santa Ana, CA 92704 (714) 751-7901

CIRCLE NO. 79 ON READER SERVICE PAGE.

If it goes on a bike, we make a cover to protect it.

Protect your bike and accessories from theft, vandalism and bad weather with a quality Ga-Zee-Bo motorcycle cover.

SEND FOR A FREE CATALOG OR ORDER FROM YOUR FAVORITE DEALER TODAY.

"Ga-Zee-Bo"™ MOTORCYCLE COVERS

BY: TEX-ALL COMPANY, INC., 14001 N. McKINLEY RD., MONTROSE, MI 48457
PHONE TOLL-FREE (800) 521-7916 IN MICHIGAN (800) 482-0988

CIRCLE NO. 35 ON READER SERVICE PAGE.

SHELL-GAME .... *Continued from page 74*

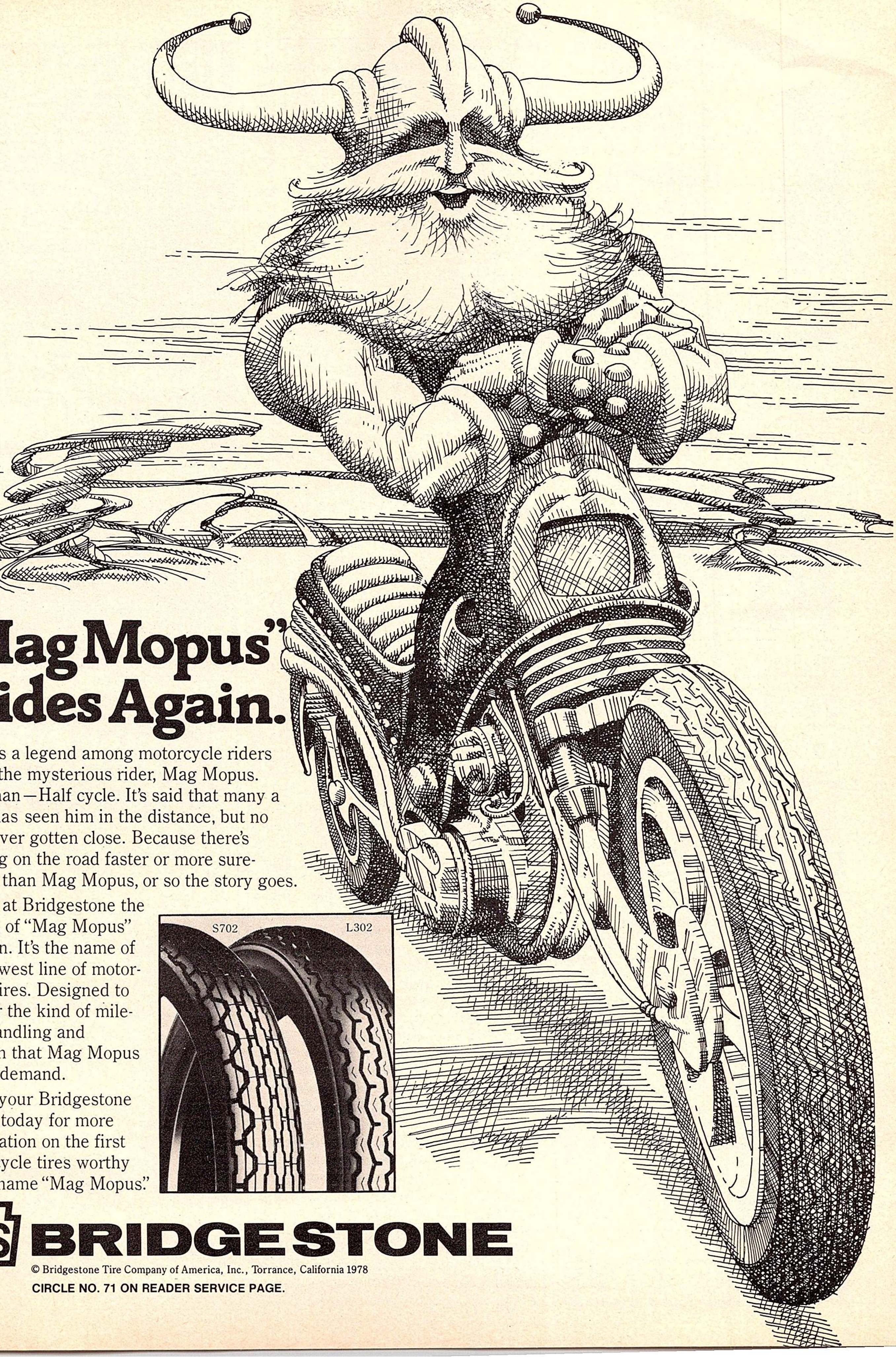
few years. They'll lower their premiums on these bikes, hoping to lure customers away from Atlantic Cycle. At the same time, Atlantic Cycle is doing better than average on 350cc to 500cc machines, so they lower their rates just a bit in order to steal business from Universal. Enter the independent insurance broker. He is a free agent who can represent as many insurance companies as he wants. And he wants to keep his customers, too. So he'll sell Universal coverage on 250 to 350s, but Atlantic on 350s to 500s. This is called "cherry picking" in the business, and it drives the companies wild.

At the same time Universal lowered its rates on small bikes, it probably raised its rates on 350 to 500s to compensate. But now the brokers aren't selling any of the 350 to 500 insurance from Universal, and correspondingly, none of the 250 to 350 policies from Atlantic. The riders are happy to have the lowest rates being offered, the brokers are happy to sell more insurance and collect more commissions. But the companies say they lose a fortune because they're selling insurance on only one category of motorcycle, at a rate that's reduced. They might still insure the same total number of machines, but there won't be any on which the premium is too high where they can make a profit to offset their losses on the category where their rates are too low.

Motorcycle insurance rates are figured over the full year, even though most riders are "sunny day" riders who only go out in the summertime. The insurance company is counting on those "claim-free months" in the winter to offset its high loss ratio in the summer. That's why six-month or nine-month policies are usually prohibitively expensive compared to full-year policies, since the full term of the policy occurs in the high-loss season. Surprisingly enough, this is just as true in California and Florida as in New York and Maine. Even though it may be warm enough to ride year-round in Miami, the kids who ride motorcycles all summer are in school in the winter. So they ride less and have fewer claims.

According to Leo Cisper of Universal, motorcycle insurance is so competitive and his profit margin so narrow that two rainy weekends in August mean the difference between running in the black and running in the red in any given year. On a rainy weekend, nobody rides, so there's less exposure to risk than Universal has allowed for in its rates. So they're ahead. By the same token, an abnormally mild winter in the Northeast means more riders will be tempted to ride on nice days, which means they'll have more accidents and more claims. The torrential rains that besieged California all winter have been an absolute bonanza to the motorcycle insurance companies, a gift from heaven as far as their profits are concerned.

(Continued on page 86)



"Mag Mopus" Rides Again.

There's a legend among motorcycle riders about the mysterious rider, Mag Mopus. Half man—Half cycle. It's said that many a rider has seen him in the distance, but no one's ever gotten close. Because there's nothing on the road faster or more sure-footed than Mag Mopus, or so the story goes.

Well at Bridgestone the legend of "Mag Mopus" lives on. It's the name of our newest line of motorcycle tires. Designed to deliver the kind of mileage, handling and traction that Mag Mopus would demand.

See your Bridgestone dealer today for more information on the first motorcycle tires worthy of the name "Mag Mopus."

BS BRIDGESTONE

© Bridgestone Tire Company of America, Inc., Torrance, California 1978

CIRCLE NO. 71 ON READER SERVICE PAGE.

5-Day Delivery Guaranteed or Your Money Back!

NEW! FIRST TIME
MFG. DIRECT TO YOU
TEAM NAME, TEAM COLORS

DENIMS!

$18.99

Reinforced with Herculite at Knees and seat
Super Tough Blue Denim

Padded Knees and Hips, Zipper legs, Removable Hip and Knee Pads will accommodate cups

Sizes: CHILD 24-26
ADULT 28-30-32-36-38-40

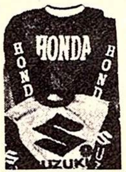
No. 1 Yamaha	No. 4 Kawasaki	No. 7 Penton
No. 2 Honda	No. 5 Bultaco	No. 8 Can-Am
No. 3 Suzuki	No. 6 Husqvarna	

14 Oz. "Competition Fighter" Heavy Wt.

DENIMS: $16.99 **15.99 No Name**

As above / without Herculite Reinforcing

MOTOCROSS JERSEYS



$7.99 Fine quality U.S. made jersey. 100% nylon in bright team colors, with cycle name across chest and on sleeves.

Adult Sizes: S-M-L-XL

(Not An Iron-On Design)
Hand Screened

No. 1 Yamaha	No. 5 Bultaco
No. 2 Honda	No. 6 Husqvarna
No. 3 Suzuki	No. 7 Penton
No. 4 Kawasaki	No. 8 Can-Am

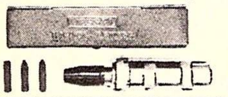
Crossbar Pad KAWASAKI

SPECIFY 8" OR 12" SIZE WHEN ORDERING

8"-$2.25 **12"-$2.75**

ALL BIKES AS ABOVE ONLY

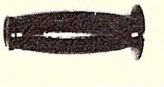
Vessel Impact Driver



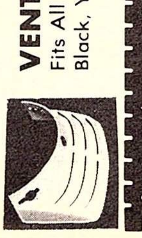
$8.99

Complete with 4 bits in rugged metal box.

CUSHION GRIP



With ribbed air chamber for that super-soft feel. Black only. **$1.99**



VENTED DUCKBILL
Fits All Helmets
Black, Yellow or White **$1.99**

Signature ______

Quan	Item No	Description	Size	Price

Orders under $20 add $1 shipping. On orders $20 or more we pay shipping. Cash or M O for prompt shipment. Checks require 2 weeks minimum to clear. Canadian and all other foreign orders add $2 COD orders add $2 shipping

Ship to ______
ADDRESS ______ CITY ______ STATE ______ ZIP ______

ROUGH RIDER CLOTHING & ACCESSORIES
5557 Big "A" Road Douglasville, Georgia 30135 404-942-6497

SHELL-GAME .... *Continued from page 84*

Obviously, the insurance companies are playing edgy statistical games. And each motorcycle is different. Leo Cisper says, "The bigger the bike, the more likely it is to be carrying a passenger who'll file a liability claim in an accident." So that raises big bike rates.

Another problem for the insurance companies is the curiously changing motorcycle market. Motorcycle sales averaged 1.3 million units from 1971 through 1974, then fell to 940,000 in 1975 and one million in 1976. At the same time, the motorcycle industry's total gross revenue rose significantly since bikes are increasingly bigger and more expensive. This combination of lower unit sales but higher gross sales adversely affects the insurance companies in two ways. First, since the number of premiums is down, claims are spread over the same size base. But since there are more big bikes—which are more dangerous, more expensive, more frequently carrying passengers and more likely to be stolen—both the number and size of claims are up. So, logically, motorcycle insurance rates have gone up, too.

In New York, North Carolina and other states, the insurance superintendent has declared a rate moratorium. According to the specialty insurance companies, they've all lost money nationwide each year since 1975; in this time frame, unit sales of all motorcycles dropped off and then began a steady upward march. Even worse, in terms of the future, most insurance experts forecast sluggish sales for the motorcycle industry—despite the fact that more new motorcycles were sold in 1976 and 1977 than in all but three of the "boom" years between 1964 and 1974. The 18.5 per cent annual growth rate between 1964 and 1974 meant big profits; slower growth means the insurance companies are looking for business elsewhere. Since slow growth means small profits, companies will focus their energies on some other area—boats or baby-buggies or whatever—where the same effort will produce more money. The result is that a few companies now control all motorcycle insurance in something approaching a monopoly. And that means higher rates.

Since big insurance companies already avoid motorcycle insurance except for preferred risks, and since specialty companies are losing money and moving out of the motorcycle field, it's a pretty good bet that no relief for rising rates is going to come from the insurance industry itself. To do that would require restructuring the entire insurance business to eliminate the stupefying inefficiency which gobbles up 45 cents out of every premium dollar. This revolution won't come in our lifetime.

But the insurance industry isn't completely to blame. In what has become a landmark case, last year James Peeples of Saginaw, Oregon, was awarded $1.76

USED PARTS

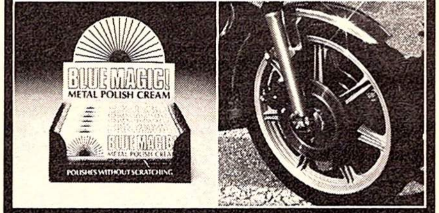
Save 40-60%

HONDA-KAWASAKI-YAMAHA
SUZUKI

Clinton Cycle
& Salvage Inc.

FOR PARTS OR FREE PRICE LIST
Call or Write 301/297-8412
6709 OLD BRANCH AVENUE
Washington, D.C. 20031

THE SHINE'S ON US



Blue Magic is the finest metal polish money can buy and you can try it for free! 100% non-abrasive cream is ideal for chrome, aluminum and mag wheels, as well as plexiglass. 100 gram tubes available at motorcycle shops or write us for a free sample.

BLUE MAGIC

P.O. Box 3145-C, Long Beach, CA 90803/(213) 431-7865

CONDOMS BY MAIL!

All NATIONALLY ADVERTISED BRANDS

Imagine getting 100 condoms in a single package – by mail. Population Planning, the most respected retailer of birth control products, offers you the largest selection of men's contraceptives available anywhere in the country, including all **TROJAN** products, new **TEXTURE PLUS**™ featuring hundreds of "**pleasure dots**™" (available only from **PPA**), **BOLD 45**™ – world's first color condom with texturing, **HOT LINE**™ new preshaped for maximum sensitivity, and 28 other nationally advertised brands. Our illustrated 40-page catalog offers non-prescription contraceptives for men and women, a large selection of books on sex and birth control, high styled clothing and much more.

Our famous condom sampler packages ($5 and $8) let you try top quality brands and choose for yourself. Or for fantastic savings why not try the new "Super 100" sampler of 100 leading condoms, 20 brands (a $30 value for just $20!). Here is our guarantee: If you do not agree that PPA's sampler packages, illustrated catalog and overall service are the **best available anywhere**, we will refund your money in full – no questions asked.

©1978 PPA

Population Planning, Dept. CY8-H
Apple Court, P.O. Box 400
Carrboro, N.C. 27510

Gentlemen, please send in plain package:
☐ Sampler of 22 assorted condoms (different brands) plus catalog, $5.
☐ Deluxe Sampler of 38 assorted condoms (different brands) plus catalog, $8.
☐ Super 100 Sampler of 100 assorted condoms (different brands) plus catalog, $20.
☐ Illustrated catalog alone (features condoms, clothes, books on sex and birth control and more), 25¢.

Name ______
Address ______
City ______ State ______ Zip ______

million in a lawsuit against Kawasaki Motors. Peeples was paralyzed in a motorcycle accident, and while he was found 30 per cent at fault because he was speeding, Kawasaki was found 70 per cent at fault because the drivechain snapped and caused the crash. Hence the huge award to Peeples.

The case has had many scary ramifications. Motorcycle manufacturers are suddenly fair game for product liability suits, and by extension so are motorcycle dealers. That's something industry leaders have long been aware of. Let's say a motorcycle is involved in an accident and the frame is bent and the front suspension tweaked around. In the old days, the dealer might have straightened the frame and pulled the front end roughly into alignment. Let's say this cost $200 to the insurance company.

Now, if the rider goes out and gets in a second accident, he might sue the motorcycle dealer (and perhaps the manufacturer) for an improper repair that caused him to crash. The dealer is taking no chances. Instead of repairing the bike, he'll strip everything off, install a new frame and a completely new front end, plus anything else that might in any way look damaged. This might cost $2000, which means the insurance company has just seen its cost go up 1000 per cent for something totally beyond its control.

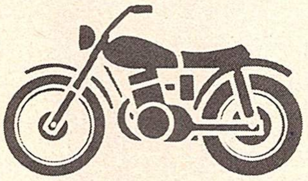
In a case like this the company would probably "total" the machine, something that costs the company far more than the price of the bike. There are hundreds of dollars in man-hours for insurance adjusters, extra paperwork and, if it comes to that, legal fees. Ultimately, you're the one who'll pay for James Peeples' accident, in the form of increased prices on a new motorcycle—that $1.76 million has to come from somewhere—and increased insurance premiums to cover increased repair costs to avoid product liability suits.

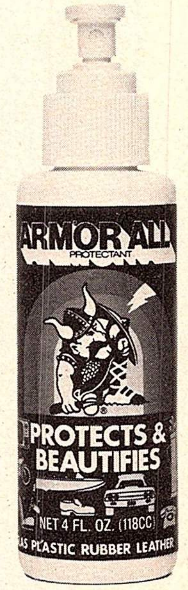
Motorcycle insurance rates get raised by all sorts of seemingly unrelated factors. After Congress decided that federal highway funds could no longer be used to force states to legislate mandatory helmet laws, the Department of Transportation discovered the fatality rate consistently went up 20 per cent in those states which repealed their helmet laws. Few insurance companies offer medical coverage for the motorcycle rider, but passengers *are* covered. And in states without helmet laws, the companies show a much higher claims record in medical injuries from motorcycle passengers. This ultimately shows up as higher premiums in all states, since the companies try to offset their losses in non-helmet states by raising the rates in states with fewer claims.

Or consider Environmental Protection Agency emissions laws and DOT safety laws. All these requirements add to the price and complexity of the motorcycle, and to meet EPA demands for clean air

(Continued on page 88)

Cycles are recycled.





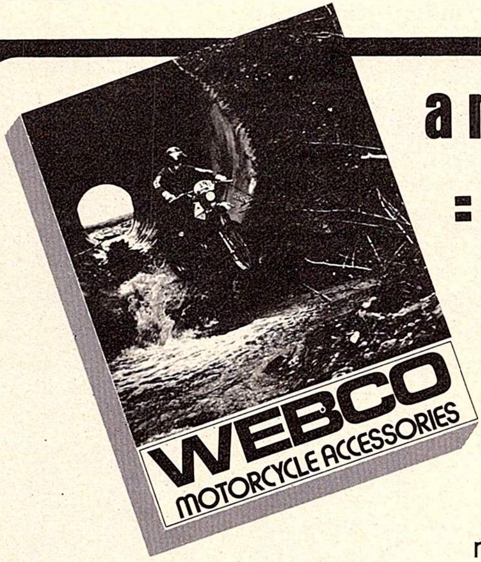
Rot makes your hummer look like a bummer.
ARMOR ALL Protectant is the one-of-a-kind, patented product that fights Rot. It protects, beautifies, preserves any part of your bike, all your ridin' gear, and *anything* you own made of rubber, vinyl, plastic, or leather.
Get ARMOR ALL Protectant at your bike dealer or the automotive department of your favorite store.

MAKE YOUR WORLD LESS ROTTEN®

©1978 Very Important Products, Inc.

CIRCLE NO. 91 ON READER SERVICE PAGE.

a new Catalog = new products from . . . WEBCO



Whenever we bring out our new catalog, you can be assured that we'll have the best in new ideas and products in it. That's because all of the people at WEBCO are cycle enthusiasts — we know what appeals to riders and what we would want ourselves. Items like: HELLA Quartz lights . . . AMCO luggage racks and accessories . . . S & W shocks and springs . . . UVEX goggles . . . C.D.I. ignitions and a fast assemblage of touring and street accessories. Write for a copy of the motorcyclist's favorite book of performance and pleasure equipment but enclose $2.00 for costs and handling.

WEBCO
MOTORCYCLE ACCESSORIES
BOX 429 · VENICE, CALIF. 90291

Get your Apple Warmer™!!

Lockhart Industries, the folks that cool your oil, want to warm your neck with our new product, the Apple Warmer!

Now you can ride in comfort without chilling drafts. The Apple Warmer protects your eyes from tearing, long hair from tangles, keeps your neck dry.

Our quilted nylon construction is washable, tough, water-repellent, and breathes so your shield stays clear.

No helmet modifications! The Apple Warmer attaches to your full face or open face helmet with easy on, easy off velcro tabs.

Suggested retail price $12.95
California residents add 6% sales tax

LOCKHART INDUSTRIES INC.
15707 Texaco Ave. / Paramount, CA 90723 / (213) 774-2981

CIRCLE NO. 46 ON READER SERVICE PAGE.

Performance Starts Here

On or off the road your bike will be running at peak performance with the best cycle lubricants and cleaners made by:

RADIATOR SPECIALTY CO., CHARLOTTE, N. C. 28237

CIRCLE NO. 60 ON READER SERVICE PAGE.

SHELL-GAME .... *Continued from page 87*

while still retaining acceptable performance, motorcycle engines will become larger and more expensive. You know the result. When a new bike is wrecked or stolen, it costs more to repair or replace. The insurance claim is higher, and it follows that the insurance premium must be higher, too.

Or take motorcycle advertising, a particularly sore point with both insurance companies and safety fascists. In the medium gray eyes of every conservative insurance man, every motorcycle ad that trumpets high speed, quick quarter-mile times or peg-scraping cornering is another psychological boost for reckless riding. Better add a few more dollars to your premium.

Motorcycle magazines are to blame, too. Seeing full-color photos of editors on motorcycles with sparks flying off the footpeg encourages riders without the necessary skill to try the same thing without the same success. Result: higher premiums. Choppers and café racers have had a similar effect. Choppers are considered inherently dangerous by insurers, while café racers invite riders to get in over their heads. In either case, the claims and rates go up another notch.

Of all the factors that irk motorcycle insurance companies, the sheer vulnerability of the bike itself seems to infuriate them most. It's virtually impossible to prevent a motorcycle from being vandalized, stolen and stripped or tipped over in its parking place. From the insurer's point of view, the manufacturers are to blame for not installing theft alarms and locking center stands, for not using vehicle identification numbers on every expensive part, for not using a wider variety of key and lock combinations. It's very easy to point accusing fingers in the motorcycle world.

In the last analysis, *everybody* is to blame because you're getting shafted on your motorcycle insurance. The insurance industry is riddled with inefficiency. State governments and insurance commissions are notorious for graft and corruption. Most manufacturers are thus far insensitive to problems of theft protection and high performance. Riders figure the insurance company is just another amorphous arm of the all-powerful military-industrial complex that should be ripped off whenever they get the opportunity. The government has made the cost of machines go up and up with emissions and safety laws, while at the same time Congress may have increased fatalities by rescinding the mandatory helmet laws. Even the declining value of the dollar versus the Japanese yen and German mark has raised insurance premiums by raising the price of motorcycles. Nobody is to blame. Everybody is to blame. There's only one thing for sure. High as motorcycle insurance is, there's not a hell of a lot you can do about it. ◉

BLACK MAGIC ....*Continued from page 50*

thickness built up killing heat through the flexing of use. Later, the cellulose fiber rayon was a considerable advance, its greater strength permitting use of fewer plies. Tires became lighter again, and they wore longer.

This early period in the rubber industry had been a tumultuous one, with vast fortunes made and lost as rubber companies jockeyed for world markets and sources of supply, but World War II threatened to cut off vitally needed natural rubber from the Far East.

The war swept such needs aside in its usual fashion, sending men looking for answers without regard for cost. Synthetic rubber, long a laboratory curiosity, was now made in volume in huge government-financed plants. The most useful product was styrene-butadiene rubber (SBR) which had many of natural rubber's desirable properties with many new ones of its own. When combined with the new high-strength nylon fiber cord, SBR opened up whole new areas of tire design. The first of the SBR tires for motorcycle use were announced as "cling" or "road hug" by the advanced British industry. The material had high tensile strength and hysteresis and gave outstanding grip even on wet roads.

Rubber compounding is a field so complex that success in it seems genuinely a black art. I visited Goodyear recently and met a rubber compounder. Much to my disappointment he did not wear a tall conical hat emblazoned with the signs of the zodiac, nor did he appear to be harkening to the music of the spheres. He seemed a practical man. He would have to be. His company expects him to formulate, from the thousands of possible ingredients, only the desired product, not the infinity of other possible ones, steering it successfully out of a quagmire of half-knowledge and rules of thumb.

Cured rubber is strong because its chains are crosslinked every hundred molecules or so by sulfur bonds and because of the presence of carbon black, whose surface activity acts to further tie the structure together. Trapped in the twisted mass of chains may be extender oils or resins, their molecules acting to smooth the sliding of the chains over each other, making the rubber softer in use, easier to mix in manufacture. Each type of rubber has its special properties such as the solvent resistance of chloroprene, the elasticity of natural rubber, or the low gas permeability of bromobutyl. The cure of each has its special requirements, depending on the job, depending on what other ingredients are used, depending, depending. Everything affects everything else in a mind-breaking dialectic. I suspect rubber compounders must also have patient, phlegmatic dispositions.

With so many variables there is little that can be protected by patent. Even

(Continued on page 90)

THINK TWICE!

BEFORE YOU INVEST IN AN ELECTRONIC IGNITION SYSTEM.

When you get right down to it, there are really only TWO types of electronic ignition: Capacitive Discharge and Transistorized-Inductive. We make both types. Our CDI systems offer the ultimate in power and reliability for racing or high-performance street bikes. Our transistor systems can save you money and maintenance and will work with stock or high-output coils. Both represent the latest in electronic technology applied to ignition system design. Both were developed and proven on the race track, so they will live a long, long time on the street.

We also have a REV-LIMITER. This plug-in accessory can save your engine if you miss a gear. And battery packs for road racers. And technical assistance if you need it — before or after you buy.

Reliability? Ours is the highest. We back that statement with a FIVE-YEAR WARRANTY. Competition use included. And we back our warranty with very fast emergency service. We'll fly a spare part to you if necessary — at our expense. Nice to know if you're planning any long trips.

We have ignition systems and related components for all in-line fours, Yamaha's RD-350/400 and TZ road racers, and others. Please call or write regarding your specific application.

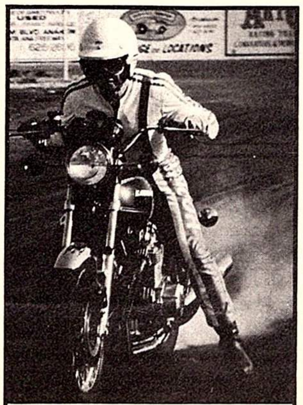
POWERS ELECTRONICS INC.

210 PACIFIC DRIVE • BOLINGBROOK, ILLINOIS 60439
TELEPHONE (312) 739-6682

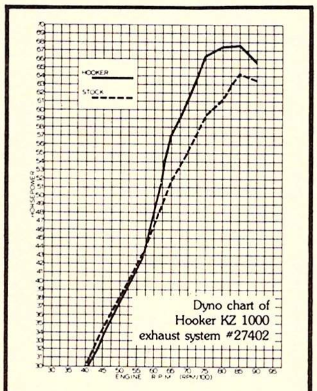
CIRCLE NO. 29 ON READER SERVICE PAGE.

Don't Believe Dave Spangler

Dave Spangler is an expert rider. And president of Hooker Industries. He rides a Kawasaki Z1000 with a four into one Hooker exhaust system. He claims this combination is hot. And he went to the track to prove it. The only change was the Hooker system. And even though he's a solid 205 pounds, he picked up one half second and 5 mph over stock in the quarter mile! He may be right. But you don't have to believe Dave. Hooker has a dyno that tells the truth. And it shows that Hooker exhaust systems deliver real horsepower. Horsepower when you need it; accelerating, passing or cruising. Ask for Hooker by name. It's the one sure way to get the best.



¼ Mile Results • February 16, 1978
STOCK • 12.98 seconds ET • 103.56 mph
HOOKER • 12.52 seconds ET • 108.17 mph
Orange County International Raceway
Rider, Dave Spangler



Stuska Dyno Results • February 14, 1978
Hooker's California Facility
Engineer, Ross Thompson

Hooker T-Shirt & Sweatshirt! Order Direct!
You're right. I've looked everywhere and couldn't find the original Hooker T-Shirt & Sweatshirt in all white, with stunning Hooker logo.
Long sleeve sweatshirt-**$7.95** short sleeve T-shirt-**$4.95** Total $______
So please send me ____S ____M ____L ____XL
Name ____________________
Address ____________________
City __________ State _____ Zip _____
Master Charge Card # __________ BankAmericard Card # __________
Expire Date __________ Signature ____________________
Please send check or money order to Hooker, P.O. Box 4090, 1032 W. Brooks St., Ontario, Calif. 91761. Sorry, no C.O.D. Freight included. California residents add 6% sales tax. Offer valid for continental USA only. Void where prohibited.

BLACK MAGIC .... *Continued from page 89*

chemical analysis of a competitor's product cannot reveal the steps of its manufacture. Secrecy is a tempting policy and has a long tradition. Keep the doors closed, put the windows up high, and if nobody talks, a new process can make money for the company for a long time. One well-known international company identifies its materials only as A, B, C, etc. Only senior compounders have the names. Workmen on their way to install new machinery are conducted to their jobs through opaque plywood tunnels, shielding their possibly not-so-innocent eyes from sight of secrets untold. There are even rumors of bonuses paid to employees for outstanding and obsessive secrecy beyond the call of duty.

Still, ask a tire man what tires are made of. He will answer, smiling, "Rubber, sulfur, carbon," and his eyes will get a distant look if you press the matter.

Water on the road can lift a fast moving tire right off the surface, supporting it as oil does a bearing. This is aquaplaning, in which the water cannot leave the space between the advancing tire and the road fast enough for contact to be established. Therefore street and other all-weather tires have a pattern of drainage channels cut into their treads to give this trapped water someplace to go. No matter how great the drainage, however, there is always some speed high enough, some water depth great enough, to result in aquaplaning.

As drainage channels are made more generous, the remaining area of rubber shrinks. Not only does this rubber have to work harder, but the tread elements or blocks are subject to bending under the shear forces present in the contact patch. To buttress them against this bending, tie bars are sometimes molded into the drainage channels, joining the tread blocks into a stronger whole. The worst case, that of a knobby on pavement, makes the tall tread blocks act like little legs which waddle sideways under cornering stress.

Dunlop, with its long experience of motorcycle racing, has a rain racing tire developed from their old triangular series. The narrow apex of the triangle serves well to cut through standing water, and the sides are equipped with stable circumferential zig-zag separated by drainage channels.

Goodyear's rain tire first appeared with a hand-cut tread pattern for the cold, rainy English Match Race Series a few years back. Its tread blocks have the same shape as used on Goodyear's Formula One car rain tire, with very generous, deep, drainage channels. Today's tire has a molded tread pattern with tie bars bracing the blocks. This tire works best in an actual downpour and likes standing water, in which it throws up a high roostertail like a moving hydroplane.

(Continued on page 92)

PROVEN PERFORMANCE

Records speak for us! We claim to be number one in motorcycle performance and we can back it up!

Over two dozen national drag racing records have been established by R. C. Engineering customers.

Our racing activities allow us to develop and thoroughly test new products for strip and street. Our strip results are incorporated into our street performance products. From Scavenger Exhaust Systems to complete engines, R. C. Engineering has the experience to be *your* performance motorcycle product company.

R. C. Motorcycle Products . . .
proven performance—
performance proven.

R.C.
ENGINEERING

FOR THE COMPLETE STORY, SEND $2.00 FOR OUR LATEST CATALOG TO:

R. C. ENGINEERING
16216 - A S. MAIN ST.
GARDENA, CA. 90248

MTA
MEMBER

DUNLOP

FREE INNER TUBE

360x18	K81	$33.66 + $ .90
410x18	K81	39.17 + 1.17
430x18	K81	42.12 + 1.34
360x19	K81	35.81 + .92
410x19	K81	40.03 + 1.02
350x18	K87	25.90 + .96
400x18	K87	31.25 + 1.18
400x18	K87 MK11	36.42 + 1.18
300x18	F7 Rib	20.11 + .67
325x19	F7 Rib	27.10 + .91

24 Hr. UPS Service
to Your Door

Call collect or write

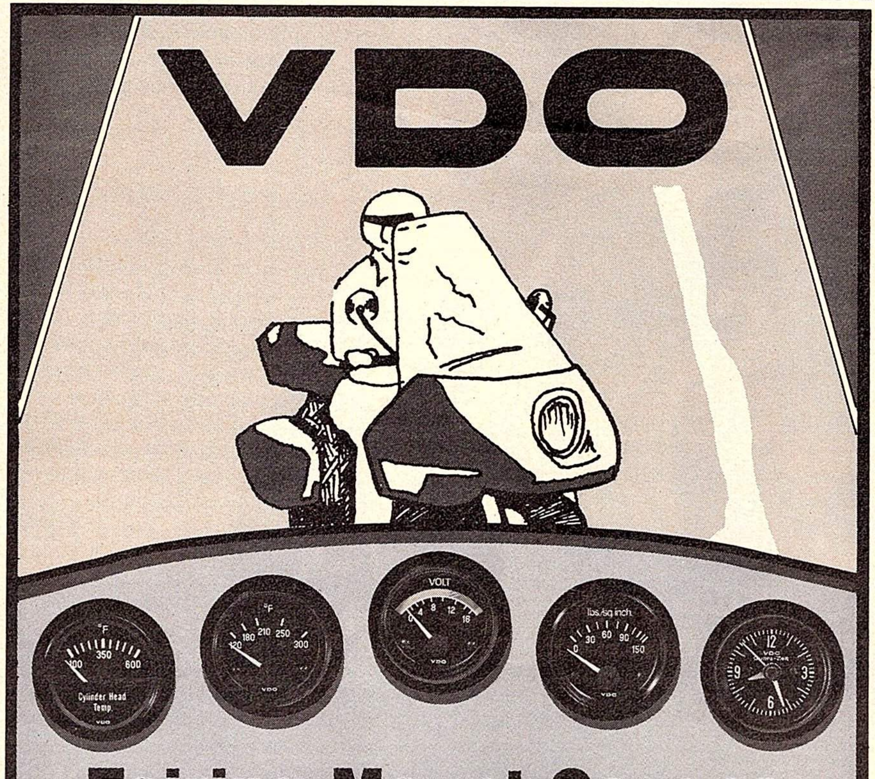
CYCLE
PARTS & ACCESSORIES
WAREHOUSE

☐ **Money order** ☐ **Master Charge**
☐ **B of A**

No personal checks accepted.
Only cashiers check.

Credit Card # ____________
Exp. Date ____________

2060 York Road
Timonium, MD 21093
301/252-6380



Fairing-Mount Gauges

A new line of gauges specially designed for easy installation on most popular touring bikes equipped with a fairing. Features exclusive shock absorber grommet. Available in oil temperature, cylinder head temperature, oil pressure, voltmeter, and quartz chronometer. Pre-wired, electrically operated, splash waterproof and night-lighted with 2-1/16″ faces. Detailed installation instructions included.

New folder describes VDO Fairing-Mount Gauges. Send 25¢ to cover postage and handling.

Name____________

Address____________

City____________State____________Zip____________

VDO CYCLE INSTRUMENTS
980 Brooke Road, Dept. 110
Winchester, Va. 22601

BLACK MAGIC........ *Continued from page 90*

For wet but not deluge conditions, intermediate tires are used, offering greater areas of better-braced tread rubber to the road. Dunlop's intermediate resembles an intricate tile floor, an interlocking array of five rows of generous islands of rubber, separated by the tiniest of channels. The comparable Goodyear has a great many more smaller elements in low relief for stability, surrounded by small channels.

Such tires are designed to carry on successfully if the weather clears, while a true rain tire will heat up and lose grip, both because of the excessive flex of its tread elements and because of the soft rubber used to ensure grip when cooled by constant water spray.

The pattern in the tread, then, exists only for rain. Dry traction is a matter of rubber and road. There is still a common belief that somehow the edges of the tread blocks cut into the road to grip it as an ice skate cuts ice. This is simply impossible. A steel skate is far harder than ice and cuts it easily. Rubber, infinitely softer than any pavement, has no chance of doing any cutting at all. On snow or dirt, of course, tread edges are a vital element of traction as they indent the soft surface, but the edges are essential in rain.

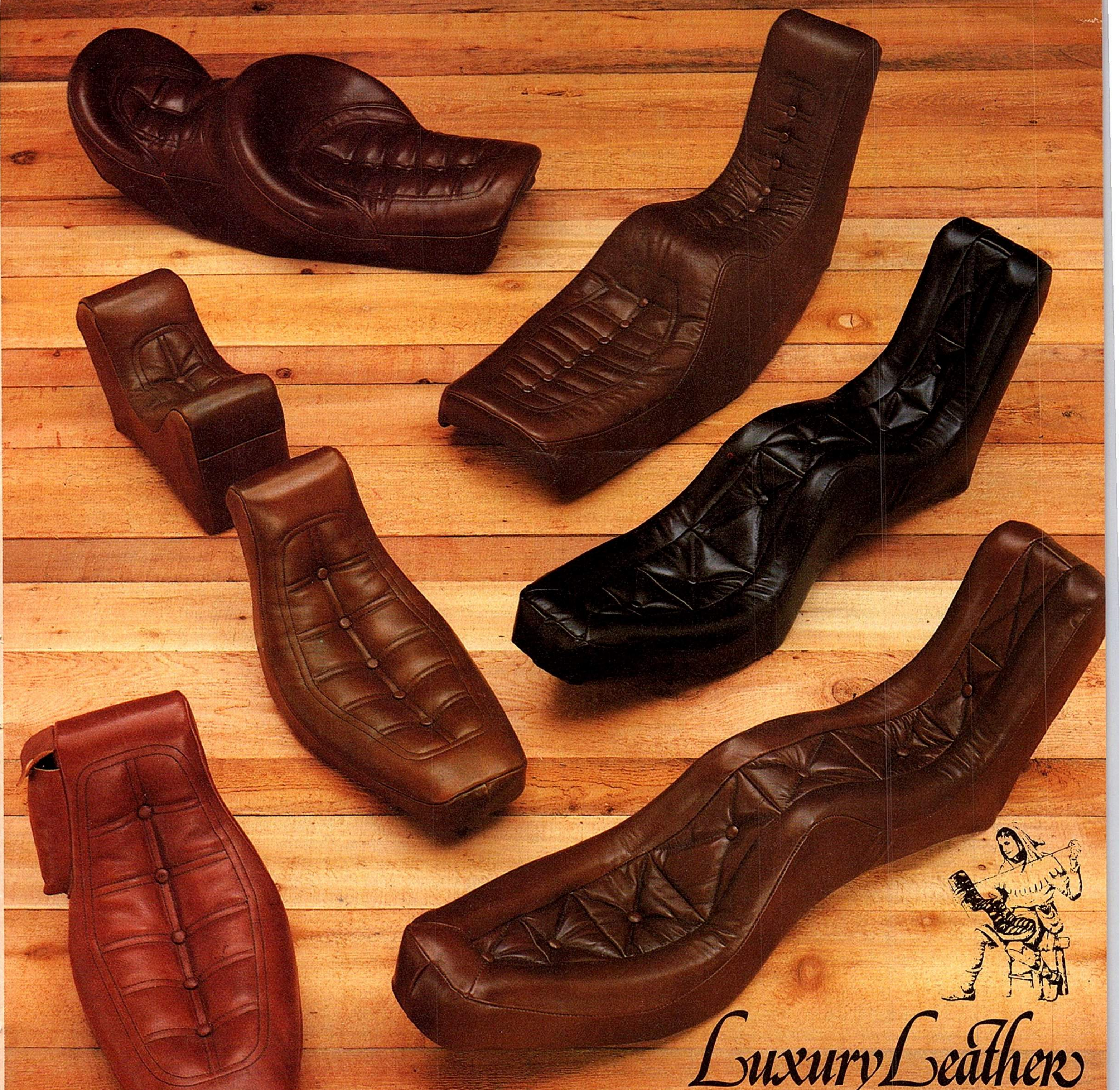
As a tread block touches down on the ground, it is the edge which touches first, exerting concentrated pressure on the water film to reach the road surface. The water is squeezed away from this edge in a wedge-shaped jet, soon to reach a drainage channel. If the speed and water depth are not too much for the tire, all the water will be squirted out from under the tread element leaving bare rubber pressing on pavement, ready to generate traction in all the familiar ways.

The orientation of the tread pattern edges is a matter for experience, but generally rear tires have traditionally placed some edges perpendicular to the force of engine torque and some perpendicular to the side forces of cornering. Rib fronts put all their edges in opposition to cornering forces, with little to handle brake torque.

Today's more powerful engines and brakes have wrought some changes here. Squarish block rear patterns and rib fronts seem to be giving way to strongly-braced, continuous zig-zag ribs, front and rear, which place their edges at a compromise 45-degree angle to the principal stress directions.

Then there are the slicks, those curious and effective products of racing specialization. How did they come about? The legend is that one year at Indianapolis, the very skilled gentleman who hand-cut the racing patterns for one major company was sick, yet there were the contract drivers, all lined up and ready to test tires. The only thing available was uncut slicks, fresh from the mold. Contracts have to be honored, so off they went. The stop-

(Continued on page 96)



Luxury Leather

When was the last time you saw a real leather seat? Since we are one of the world's largest saddle makers, it is still possible for us to give you the real thing — and at a price many people can afford. Only a few of the many styles available for big bikes are shown. Write for a free brochure or stop in and see any of Drag Specialties' 9000 dealers around the world. (Send $6.00 for complete catalog of 5000 finer accessories for all motorcycles, refundable with first $25.00 order.)

© Drag Specialties Corporation, 1978

E&S coach and saddlery extraordinaire

A Drag Specialties Company

SEND INQUIRIES TO: Drag Specialties Corporation, P.O. Box 9336, Minneapolis, Minnesota 55440

BLACK MAGIC........ *Continued from page 92*

watches said it was a breakthrough, and slick tires have been faster ever since.

Is there a better way to brace a tread block than to make it cover the whole tire? Won't such a tire flex and heat up far less than a rubber forest of individual tread blocks? Slicks did a lot of things better. Running cooler, they could be made either thinner or softer. When made softer, tire traction went up considerably.

Motorcycles on slick tires can now corner above 1.3 G on a good surface. Their grip is so good that riding styles are changing to exploit it. Braking hard enough to get the rear wheel up was remarkable two years ago, but now it's seen at club races. Riders once strictly separated the acts of braking, cornering and accelerating. Since slick tires grip so well and don't seem to care from which direction the forces are coming, modern riding is mixing force vectors together, keeping the tire working to capacity, adding lean as braking tails off, then feeding in throttle as the machine is rolled upright after the corner.

The extra cornering force is bending the motorcycle too, producing wheel chatter when natural frequencies of frame flex and tire hop coincide. Changing tire pressure affects vertical spring rate, so this sometimes helps, along with altered spring and damping rates. In the end, it's the frame which must change, a lesson learned and re-learned at every manufacturer every time tires improve.

A visit to tire-building operations at both Goodyear and Dunlop in this country convinces you that the tire business is big business, a primary industry. The process looks simple enough. Its complexities are hidden. The raw materials, such as natural and synthetic rubber stocks, sulfur, cure accelerators, antioxidants, carbon black and extender oils or resins are hoppered into huge, powerful Banbury mixers. Interlocked rotating impellers squeeze, knead and shear the mix to the desired degree. Time, rate and temperature of mixing are just as important as the formulas themselves. Racing rubber, with its tenacious hot strength, requires special treatment here.

Discharged from the Banbury, the rubber is conveyed to a tread extruding press called a tubing machine. From its shaped jaws pours a long, carefully contoured strip of tread stock. Its contour ensures that a certain tire will fill its particular tire mold perfectly, with no rubber having to flow far to do this. Such lateral flow in the mold could disturb the tire cord, leaving a weak spot. The tread extrusion is cut on an angle so it can be skived together when wrapped around the tire.

Meanwhile, the fabric which gives the tire its strength must be coated with rubber to allow it to become part of the tire. Some companies dip the cord in liquid rubber preparations while others calender thin coats of special rubber onto the fabric. The fabric itself is composed of fibers running lengthwise only, their spacing preserved by occasional wefts, transverse fibers. The size, twist and spacing of the fibers all have important effects on the behavior of the finished tire.

Motorcycle tires have bias construction, with the fabric's fibers crossing the centerline of the tread at some angle other than 90 degrees (the radial cord angle). Because of this, the rubberized fabric is now cut at an angle into strips which, when wrapped onto the tire under construction, will just make a full turn, with their cord at the desired angle. Then, bundles of wire hoops to give strength to the tire bead are rubber-coated and wrapped with anti-chafe fabric strips.

Bias tires are built as flat bands on a motorized, horizontal, cylindrical drum. A worker here receives materials from a supply machine called a servicer. Selecting a length of rubber-coated, bias-cut tire fabric, the operator feeds it onto the slowly turning drum, being careful to center it properly and join the ends accurately. The fabric sticks to the drum and to itself because of tack, an intentional stickiness of the uncured rubber. The tire builder applies a bundle of bead wires to one end, then turns the excess fabric over it, locking it into the tire's structure. Next, another ply is laid on, then folded under the bead wires, locking them in in the other direction. Care is taken to trap no air between plies. Such air could lead to a weak tire, perhaps a tread separation.

The operator next may apply the tread itself, forcing it into intimate contact with the underlying structure with steel rollers. Or there may be more plies added first, with perhaps tread-stiffening plies called breakers. There might also be narrow sidewall stiffeners added, to give the tire more rigidity here.

When the work is done, the building drum collapses inward on command, and the green tire, resembling a big bottomless black wastebasket, is placed on a rack with other tires and wheeled off to the cure shop.

Curing, or Vulcanization, takes place in large and frightening-looking horizontal molding machines which open and close with funereal slowness, discharging steam, reeking of chemistry and shimmering darkly with heat. The green tire is set into such a machine and an inflatable curing bag is placed inside the tire. As the mold closes, this bag begins to inflate with hot steam, heating the tire and beginning to change its shape from that of a flat band to the familiar tire section.

With the strong bead wires preventing any movement of the tire edges, it is the tread area which bulges radially outward and to accommodate this, the tire cord layers must scissor past each other in the hot plastic rubber, always under tension, to assume the new angles of a finished, cured tire.

The mold is closed, and inflation continues, driving the green carcass and tread outward until it touches the inside of the mold. Hundreds of tiny holes drilled into the mold permit the rubber to fill every cavity as mold gases escape. The mold is hot, over 300 degrees Fahrenheit, and the rubber cures quickly, heated from inside and out. A graphite mold-release is used on the outside of the tire, a talc-like substance inside.

After the proper number of minutes, the mold yawns open again and the cured tire is mechanically ejected. The operator places it on a dummy rim and inflates it, maintaining desirable tension on the fabric as it cools.

Finally, the cooled tire will be thoroughly inspected and a certain number from each batch will be further qualified on a battery of fascinating machines.

A principal tool is the tire dynamometer, which presses tires against a large motor-driven steel roller, simulating the stresses of high-load, high-heat driving.

Other machines are used to measure the horizontal and vertical spring rates of the tire and to determine their natural frequencies. X-ray machines inspect internal structure. Various types of rolling roads evaluate wear and traction. A glass road backed by high-speed cameras is used to study ejection of water from tread patterns or to examine the distortion of a tire in braking or cornering.

Finally there is the proving ground. Goodyear's giant facility at San Angelo, Texas, includes a five-mile high-speed circle and an eight-mile road circuit, with off-road courses and smaller, specialized facilities for particular applications.

Striving to increase its market share in motorcycle tires, Goodyear is now developing instrumentation for gathering tire and handling data from running motorcycles. For automobiles, this work has made great progress over the past years in many places, but the motorcycle is a novel problem.

Dunlop, through its Japanese subsidiary company, has a hand in the development of original equipment tires for a very large share of the new-motorcycle market. Their experience in this is very great, greater than that of any other company. They have no illusions about what makes their product a good one and gives them such a large share of the world market. It is precisely this experience.

Goodyear, despite being the world's largest manufacturer of tires, has not been able to gain such wide experience because our domestic motorcycle industry is not large. Goodyear has more to gain from research and theoretical work since experience in a field just doesn't come overnight.

Marv Rifchin of the M & H Tire Company, makers of specialized tires from drag and circle-track racing, says that even though you know the giant which is able to do just about anything is standing

(Continued on page 98)

ALKA SELTZER
ALKA SELTZER
2 TABLETS with SPECIALLY BUFFERED ASPIRIN
EFFERVESCENT PAIN RELIEVER & ANTACID
Alka-Seltzer®
BRAND
2 TABLETS with SPECIALLY BUFFERED ASPIRIN
EFFERVESCENT PAIN RELIEVER & ANTACID
Alka-Seltzer®
BRAND
with SPECIALLY BUFFERED ASPIRIN

Chomp Chomp, Sip Sip
Plop Plop, Fizz Fizz.

Read and
follow label directions.

If there's one thing you always look forward to, it's a weekend party. You munch on chips and dip. You chug-a-lug your beer. You bugaloo till two.

But sometimes you overdo it. You wake up feeling less than your best. When you do, reach for Alka-Seltzer.® The moment you drink it, those tiny bubbles start to speed relief through your system. With specially buffered aspirin to soothe your throbbing head. And antacids to calm your upset stomach.

You'll be thankful you have Alka-Seltzer on hand. Because when morning comes, the only sound your aching head can bear to hear is a gentle plop plop, fizz fizz.

Alka-Seltzer®
Oh, what a relief it is!

©1978 MILES LABORATORIES, INC.

BLACK MAGIC........ *Continued from page 96*

over you, you can still make his shins ache once in a while if you concentrate your effort. It's very hard to be good at absolutely everything.

Goodyear has pretty well dominated US road racing, and their European adventure in backing Kenny Roberts in the 500 World Championship is also succeeding. Only time will tell what they will make of it.

Tires obviously are crucial in handling, since they are, we hope, the only contact between the immovable earth and the mercurial motorcycle. What street rider has not changed his handling along with his tires? That mystery wobble that appeared When Brand A tires were fitted?

Tire compound, construction and shape all influence the matter. As a machine leans into a turn, the contact patches migrate sideways as the machine rolls onto the tread edges. The contour determines whether this happens in proportion at front and back. When it's wrong, the machine can weave.

A very limber, flexible tire can put down a larger contact patch, good for traction, but a tire too flexible may allow undesirable motions of the machine. A very soft sidewall can supplement a deficient suspension, as did Dunlop's 350M tire, intended for the ill-handling Grand Prix Honda 500-4 of 1967. Excessive movement of the tread on the ground, called shuffle, can raise wear rates. To fight this, tread belts may be used to provide necessary extra stiffness.

Testing is the final answer. Putting on tire after tire, deciphering the test-rider's comments, thinking of answers. It may not be science, but it has been effective.

Ideally, special tires would be built for each machine type and load. Weight, balance, and geometry may be similar between two makes, but tire requirements may be very different. The tire is not just a traction generator—it is also a coupling between an oscillating system and a stable surface. The amount of stiffness in each plane, and the corresponding damping, will go far to prevent the many flex frequencies of a motorcycle frame from being excited to dangerous amplitude.

Cars are not so susceptible to this sort of thing because they are naturally damped; they touch the earth in four places. Motorcycles have extra freedom, and they use it in sometimes unpleasant ways. Motorcycle design, for all its advances, still often regards the frame as a bracket to hold all the important stuff in the right places. Frames are still designed by men with more than one eye on the past and only half an eye for the future. Their creations are further refined by the infamous PCD men (Product Cheapening Department) and are reshaped again by the styling section. Then we get on and ride.

By actual, irrefutable measurements on running machines, Goodyear has discovered that heavy-gauge steel frames bend routinely with excursions *measured in inches.* I stood and watched speechless before one of their graphic computer terminals as a display of frame twist on a leading brand of machine was run. The sinuous movement of the thing was almost seductive.

In an environment like this, who can expect the same pair of tires to work well on all the machines of similar weight and power? Brand A's frame is moving to the North while Brand B's is describing U-turns, and C's model executes miniature hesitation rolls. It's just a good thing that tires can and do mask many of these differences. There is more to a tire than round, black and soft.

I asked Goodyear racing engineers John Smith and Bill Hopkins about future developments, and they had two basic things to say.

"The future is next Sunday, and what happened at last week's race is ancient history. We live pretty much from race to race. Beyond that? Well, motorcycles aren't very sophisticated. Their suspensions are primitive. Even the wheelbase changes every time you change the gearing. How can you expect to get your handling right when even the most basic parameters change all the time?"

There was a spirit of extreme pragmatism in this race department, but I was aware that these men are all having a very good time. They are not eyeing the pension fund and the clock. The company seems too large to worry much about just what goes on down there as long as the results are good. For some years I have wondered why Goodyear even bothers with motorcycle road racing when their share of the street-tire market is small and there seems to be only sporadic interest in enlarging it. The motorcycle road racing department is just one little sprig on a big, rangy tree, it seems, and the accounting department never cuts off anything that seems healthy.

That's great. I enjoyed the feeling that these people were wielding a fascinating technology without having to consider its immediate utility in dollars and cents. So, there they are, putting in the points on the graph without having the time to draw lines through all of them, putting it into the *big picture.*

Because of this, there are no computers in the race shop and no shaggy math geniuses busily converting slip angles and steering torques into numbers. That's in another building. The computers are there, but they are hard at work on commercial projects. The tire business has been through revolutions before. Formal knowledge of chemistry, for example, made the rubber industry efficient, lowered costs and improved the product.

Now another revolution is in the making, and its name will be numerical analysis. Recent advances in computer power and methods have enabled such grim subjects as turbulent gas flow to be tackled successfully. Just break down the flow into packets of a thousand molecules each and you have the classic n-body problem. You also have something that takes five billion clerks with desk calculators working for five billion years to answer. Only now, the powerful machines plow through it all in a few hours.

The tire companies enviously see traditional methods abandoned in other established basic industries, replaced with computer-generated understandings of how things really work. They know how much money they will save when they can design the tire right the first time, not wasting years in trial-and-error testing. Theoretical models of tire behavior aren't impossible, just difficult. It will happen.

Beyond the mundane world of straight-up stability, wear rates, costing, and OSHA compliance, there is the agreeable single-mindedness of racing. How does the tire affect the machine's handling at really elevated speeds?

When a machine is getting into the sliding range of the tires' grip, it is first of all fundamental that the tires lose their grip slowly and in concert, front and rear. Breakaway quicker than human reactions simply fixes it so no one goes near the maximum, for any little disturbance will result in a crash.

As a tire is loaded more and more in cornering, the contact patch is distorted by the strong pull of the tire cord upon it, tying it to the rim of the wheel. The designer can build the casing in such a way as to give the desired breakaway characteristics, making the tire distortion feed in the drop in traction.

This rate of decline in cornering power has to be balanced, front and rear, since there's no use having lots of traction at the back and none at the front. The machine will switch ends, or at best, the rider will have to use extreme efforts to retain control. Because very very few riders are capable of running reliably in this narrow zone of sliding stability, it has never become a subject for much research. Still, the weight distribution of the machine, the rider's style, the tires, and the day can determine whether such stable sliding is possible or not. When it is, truly rapid motoring is the result. When it is not, but the rider persists, he tips over.

When Kenny Roberts speaks of hanging the back end out four inches and keeping it there, he is speaking of facts which can be seen on film or in the twin tracks left by a machine racing on wet pavement. The back end swings out to assume an angle to the direction of motion, the slip angle. When everything is perfect, it stays there and obeys orders.

This is the far end of a very broad spectrum of tire performance. Fortunately, most of us can be quite satisfied and happy using our tires right in the middle of this wide latitude, surrounded with lots of safe, predictable, engineered tire behavior. We can do it because there are a few people out there exploring the far end. ◉

LEE FITS AMERICA

EasyLee. The feeling's as good as the look. Lee Rider jeans and jackets are 100% cotton with Lee Set,® the SanforSet® process that starts denims softer, keeps 'em fitting smoother. The blue fades true, the size range is terrific. Check it now. The Lee Company, 640 5th Ave., New York 10019. (212) 765-5215.

cotton SANFOR SET

A company of VF corporation

Lee®

NEW
MOTORCYCLES
at
FRIENDLY PRICES!!

HONDA
DUCATI
BENELLI
CAN-AM
LAVERDA
HERCULES
MOTO MORINI

JAWA SPEEDWAY
KTM/PENTON
HUSQVARNA
CARABELA
JAWA/CZ
BULTACO
TRIUMPH

OSSA
PUCH
MAICO
ROKON
HODAKA
MONTESA
MOTO GUZZI

OVER 300 BIKE INVENTORY
Sales · Service · Parts · Clothing · Accessories
Daily UPS — Anywhere
(419) 529-8888
UNITED MOTOR SALES
1092 West Fourth Street
Mansfield, Ohio 44906
Daily 'til 8, Sat. 'til 4

New! mototek CDI
FOR YAMAHA 500 AND HONDA XL'S
Designed specially for single cylinder four stroke bikes. Timing is controlled by the revolutionary "Hall Effect" sensor located in the timing assembly. Timing is extremely precise and adjustment-free no matter how many miles you ride your bike.

Model CD-350 for Honda XL 125, 175, 250, 350
Model CD-500 for Yamaha TT 500, XT 500 $89.95
Full year Guarantee!
Increased Power! No more Points!
Improved Starting! Very easy to put on!
MARTEK Products, Inc.
3609 W. MacArthur Blvd., Santa Ana, CA 92704 (714) 751-7901

CIRCLE NO. 32 ON READER SERVICE PAGE.

Motorcycle exhaust systems for most 4-strokes on the road. Also replacement mufflers. See your dealer or write today.
Jardine
HEADER COMPANY
7142 Belgrave Ave., Garden Grove
Calif. 92641 • 714-893-7594

CIRCLE NO. 41 ON READER SERVICE PAGE.

SR500E HOP-UP .... *Continued from page 60*

and headed straight for the dyno but for one problem: the stick ruined the flow at all other lifts unless repositioned to suit the altered general flow pattern. So to make the stick work, we'd have had to mount it on a ball-swivel and hooked it to the camshaft with rods, bell-cranks and Lord knows what else to keep its position correctly aligned relative to valve lift. Casting a new cylinder head would have been easier, though not as appealing to those who adore Vincents and are in other ways addicted to oddity.

The lift-phased-waggle-stick idea provided a few moments of lunch-break amusement, and it was the inspiration for layering clay on the intake port floor. We reasoned that turbulence trailing away from the stick was helping the air make the tight downward turn into the valve seat throat, and we hoped that molding a less abrupt turn in clay would have the same overall effect. However, when the clay had been carefully smoothed into place, its most immediate result was to deepen our confusion. We did find a flow improvement at lifts up to .200-inch, but this was offset by a sharp drop at greater valve openings. Adding more clay farther away from the valve to fill the shallow dip in the port floor and relocate the pre-seat hump nearer the port entry helped—but not much. The reduction in area was limiting full-lift flow too severely to be compensated by what we fancied was an improved shape.

Jerry's instrument probes, belated cerebration and willy-nilly experimentation lofted us over the barrier we had erected for ourselves. Our problem in a nutshell (an especially apt simile) was thinking only in terms of a round port while ignoring the fact that the SR500's port wasn't and forgetting certain valuable hints about the nature of compressible-fluid (i.e. air) flow clearly stated in all books on the subject. What the books say is that when air flowing through a conduit reaches a bend, as in a pipe elbow or intake port, centrifugal force . . . effectively . . . causes it to compress and slow in the bend's outer portion while losing pressure and gaining speed at the inside. Further, the pressure differential within the bend causes an overall distortion of the flow-streams from outside to inside along the bend's walls. The net result of these forces and shifts in flow is an attempt, by the bend, to break the straight, reasonably unified movement of air through the conduit into a pair of contra-rotating spirals, with an overall reduction in flow rate.

It should be apparent in the above brief description that flow will suffer as the bend radius tightens, and that there's more restriction with greater bend angles. A table of loss coefficients for refinery pipe fittings gives a 25 per cent reduction in flow for a 30 per cent shortening of one

(Continued on page 103)

SR500E HOP-UP .... *Continued from page 100*

bend's radius, and it shows that a 90-degree elbow presents more than twice the restriction of one making a 45-degree turn. These relationships strongly recommend a port shape that turns no more than is absolutely necessary to clear the intake valve spring seat, and one that curves gently. Unfortunately, these recommendations cannot always be followed; especially not in the design of a tall, single-cylinder engine like the Yamaha SR500, and most particularly not when a tall, slide-throttle carburetor is to be fitted on the intake port. The SR500's top frame tube could not be placed much higher without giving the bike the silhouette of a step-ladder, and its carburetor had to be located under that tube. To such exigencies the Yamaha owes its low, abruptly turned port.

One's first impulse when grappling with the Yamaha intake's manifest reluctance to flow air properly is likely to be a plan for disaster. You look inside the passage, note that it starts and ends round but bulges into a rough oval at the valve-guide boss; instantly you begin to think about making it round. That fat aluminum stalactite surrounding the valve guide appears to be the worst obstruction to progress since the filibuster. We had good reason for not removing it because we once got into trouble with a similar ploy. Valve rockers' tips move in an arc, tend to put a push/pull load on the valve stems, and this tendency can be upgraded into an overpowering force when high-lift cams and ultra-stiff valve springs are fitted. Memories of a valve guide that worked loose due to high loads and inadequate support kept us from acting hastily.

Checking air velocities inside the port soon had us wondering if our first-impulse plan to attack the valve guide boss would have yielded any flow improvement to compensate for the reduced guide support. According to books dealing with fluid mechanics, the air should have been moving most rapidly along the port centerline and slowest at the walls. Jerry's velocity probes said it wasn't. There was a fairly even velocity distribution out at the port entrance but not inside, where the instruments showed air moving terrifically fast along the walls and relatively slowly at the centerline. All indications were that air was going around the thick guide boss without a hitch, though of course the velocity readings became progressively higher as we slid the probe's tip around the port sides to the floor. The valve stem itself seemed to occupy an area of practically still air. So out of respect for valve-guide loadings and because there seemed to be little advantage in removing the guide boss, we only did a bit of smoothing and narrowing at this point.

A far more drastic approach was taken in removing metal from the areas flanking the guide boss. The experiments with clay

(Continued on page 108)

DYNA III **Hi-Performance Electronic Ignition**

You can pay more . . .
You can pay less . . .
But, you can't buy
a better ignition
for your motorcycle.

Honda-4's
Kawasaki-4's
Suzuki-4's
Late BMW &
Harley-Davidson

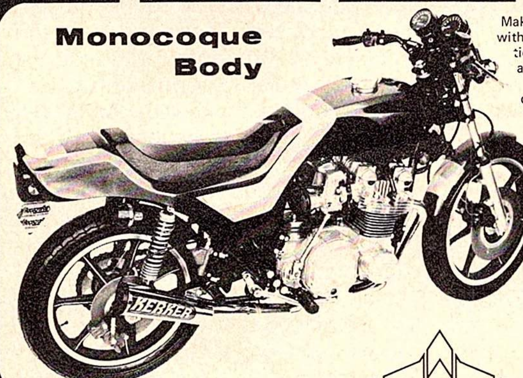
- Maximum performance and economy without ignition tune-ups.
- Road and race proven
- Extends spark plug life
- Easy installation
- 2 year warranty

$98.50
complete

K/V PRODUCTS

1062 East Cypress St., Covina, CA 91724 • (213) 331-6202

Monocoque Body



Make your Kawasaki Z1-900/1000 jet *look* like a jet with a monocoque body by Tracy. One piece construction using aircraft quality fiberglass insures strength and beauty for your motorcycle.

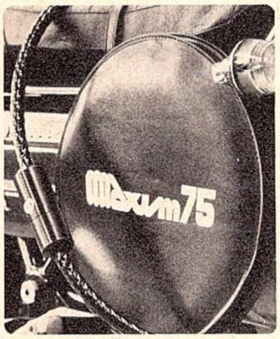
Monocoque features an integral 3.5 gal. fuel cell with custom vented cap, removable foam seat cushion that allows access to a glove box in the tail section, a center of gravity 3" lower than stock, 14 lbs. total weight, a black high gloss fuel resistant finish, and mounts in minutes without frame modifications. Common hand tools are all that's required. Monocoque utilizes stock Kawasaki tailight and fuel petcock. $269.95.

Also available for Honda 750 now, and other makes soon.

See local dealer first or if not available in your area, write for free brochure to:

Tracy Design MC2
Post Office Box 5112
Santa Barbara, California 93108
(805) 682-4758

TRACY DESIGN



Maxim Lock Company
4314 N. Western Ave.
Chicago, IL 60618

THE FINEST ANTI-THEFT DEVICE AVAILABLE

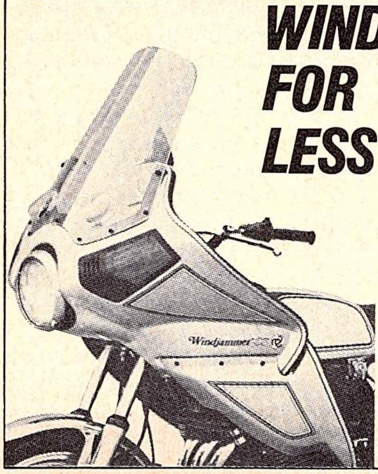
Maxum75 Maximum Security Locking Cable

For the best protection, we offer a full 5/8", six-strand high carbon steel cable with a total of 234 wires and a strength of 260,000 lbs. per sq. in. – far more resistant to cutting than a solid link of the same diameter. To protect finishes, we coat the cable with 1/8" of vinyl, giving a total diameter of 3/4", and make it a full 7 feet long, so that you can secure it to immovable objects. And, our lock is as strong as the cable – 1-3/4" of high tensile cold steel with a concealed joint. It is finished in black chrome for durability. The joint between cable and component cannot be pulled apart. Finally, there is a virtually unpickable, 7-tumbler tubular key lock. An optional carrying case stores the cable neatly, and mounts easily to any motorcycle. At a low $39.95 (carrying case $9.95 additional – add $3.00 for shipping) can you afford to be without Maxim protection? See your dealer, or if not stocked, send check or money order today.

Maxum75

WINDJAMMER SS

FOR LESS



Save $31. on the genuine Vetter Windjammer SS fairing. We have a large stock available for immediate delivery. They come complete including mounting hardware and windshield. Colors: Black, White, Silver (color match is available, see below). Reg. list: $320. Our price: ***$289.***

Order by mail or phone. Use Visa/BofA/MC. Add $20.00 to ship anywhere in cont. U.S.A. Call toll free:
Calif.—1-800-382-3600,
other states—1-800-423-5120,
or call 213-999-2811

Free 1978 catalog

The following options are available:

Bright quartz headlamp	*21.50*
Snapvents in windshield	*11.00*
Extra tall windshield	*5.00*
Lowers (shown in photo)	*69.00*
Cigaret lighter	*5.00*
Loud dual horns	*22.50*
Color match-Fairing	*70.00*
Color match-Lowers	*25.00*
NEW Vetter Saddlebags	***279.00***

Racecrafters
INTERNATIONAL INC.

Visit our 3 big stores: 7932 Sunset Blvd./Hollywood, Calif. 90046
7801 Canoga Ave./Canoga Park, Calif. 91304
7437 Van Nuys Blvd./Van Nuys, Calif. 91405

SR500E HOP-UP .... *Continued from page 103*

promised flow gains with a higher, more gently arched port floor, but only if the cross-sectional area was maintained. To that end we whittled away with one of Jerry's high-speed, air-driven porting tools until stopped by a growing fear of cutting through into the valve-gear cavity. Some metal was taken out of the port's sides; none at all was removed from its floor, which was acquiring a thick layer of clay even at that early stage in the work.

A lot of clay went into the port after the first enlargement, and all of it ended up on the port floor. There had been enough surprises to shake us out of our round-port fixation, start us actually thinking and make us willing to try almost anything. We tried a deeply rounded shape in the port throat with large radii joining its floor and sides, and the flow sagged badly. Clay was then trimmed away from the sides, moved to the middle of the floor and smoothed in place. That brought an improvement in flow though it gave the throat an unusual form: one that looked like a "D" turned flat-side down. We showed it to Jerry and he said he'd seen it before; in fact he uses the same shape in reworking other sharp-turn ports. Encouraged, we returned to the porting tools and widened the throat area as much as seemed possible.

With the port roof and sides opened upward and outward to the maximum permitted by the thicknesses of the surrounding metal, we again were able to raise the floor, which gave us another increase in flow. This was further improved slightly by reangling the stub manifold to align it with a port centerline that had been shifted by all the carving and claying. But the overall improvement in flow still was inadequate. Readings at low lifts were looking good; those taken at lifts above .350-inch were only marginally better than what we had with a stock port. The conclusion to be drawn was that while our outer-port efforts had smoothed the flow enough to more efficiently feed air to a partly opened valve, substantial resistances remained.

Most of the demonstrably successful racing ports we've seen have a rather large pocket above the valve seat. The Yamaha SR500's intake port, in contrast, has a low, flat roofline where it joins with the seat area. Adhering to Branch's First Dictum ("find out what the air doesn't like and then do the opposite") we made the above-valve pocket lower and flatter with about a millimeter-thick layer of clay. And the flow absolutely died, which was taken as a mandate to get busy carving. A hunch told us to cut the pocket's walls straight upward from the valve seat throat, parallel with the valve stem, and it seems to have been the right move. We removed as much metal as seemed wise, using the finger-feeler system of gauging impending breakthrough, went back to the flow bench and found that Branch's First Dictum had in this instance provided a perfect plan of action. There was improvement at all lifts, and—even better—the port's extreme sensitivity to its clayed-in floor arch's contour was gone. In all previous post-porting reapplications of clay (the stuff has to come out when you use cutters, or it will turn into a carpet of metal chips) we'd had to devote a lot of time to moving clay almost imperceptibly before hitting upon a floor shape that was correct. With the raised pocket, there was much more tolerance; a broader range of shapes giving near-optimum flow. This was our first clear, all-lifts success in the attempt to outsmart Yamaha's engineers, and our pride led us straight into a fall.

In Yamaha's version of the SR500 intake port there are no rounded surfaces on the valve seat. The seat is a ring shrunk in place, counter-bored with first a shallow-taper cutter to about two-thirds of its depth, then zapped with the seat-face cutter. It appears to be the child of economy manufacturing and easily improved upon by anyone with enough wit and ambition to at least blunt the sharp mid-bore edge. Appearances deceive: we stoned a small radius where Yamaha had left an edge, and lost flow. This loss was recovered only through a complete, large-radius reworking of the seat throat, and we aren't entirely sure that the "streamlined" shape we created was quite as good as the original. And our advice to anyone who may be thinking of following in our wobbly footsteps is to leave the SR500's valve seat strictly as-is. The best of the modifications we made was by the most generous assessment a stand-off, and we lost ground with the others.

Air flow continues past port and valve, which means you have to look for possible obstructions around the combustion chamber side of the valve seat. There is one in the SR500, and it's as obvious as a thumb in the eye. Yamaha clearly placed great importance on having a nearly flat piston crown in this engine, using valves angled only slightly from the vertical and combustion chamber walls moved inward from the classic hemispheric form to get an adequate compression ratio without resorting to a domed piston. It was a good choice to the extent that they made a light, cool-running piston, but they also ended up with chamber walls that slightly shroud their intake valve. We corrected this by cutting a .200-inch-radius relief around the valve seat and were rewarded with a slight flow increase. A suspicion that the upper cylinder wall was also shrouding the valve led us to grind a small eyelid relief adjacent to the intake valve, extending away from the bore three millimeters and downward five. This relief would expose part of the piston's top fire land to direct combustion heat but that would be an acceptable risk if it proved an aid to air flow. It didn't: we had no flow gain at all from the cylinder relief, though this measure has worked in other engines.

Through all the experimentation done up to this level in our porting project we'd been checking our progress by testing the whole intake system, complete with a 36mm Mikuni carburetor. Some individual steps involved replacing the carburetor with a short intake bell, which was done for the sake of convenience, but most of it was full-system development. An early spot-check made with a 38mm carburetor showed us no more than a twitch-size elevation of flow readings and there was at the time no suggestion that anything bigger than the 36mm Mikuni would be needed to feed all the air the port could handle. Even so, having made some small overall improvement in the port we decided to give the larger carburetor another try—and found improvements in flow all the way from .050- to .500-inch lift. The difference was not overwhelmingly large, but we had long since left behind any quantum-gain illusions we may have had at the project's onset. Very soon we had learned to be delighted with all but truly miniscule improvements.

For many hours of trying and erring after switching to the larger Mikuni we made no progress at all. The accumulated gains already made did amount to genuine progress, and we had to face the possibility that no more would follow unless we abandoned our resolve to avoid radical surgery. Flow at .400-inch lift was up from 110 to 120.6 CFM, with a rise to 124.5 CFM at .500-inch lift, which wasn't bad. Jerry said it was a bigger improvement than he'd expected, given the restraints we'd imposed on ourselves, and he repeated his suggestion that we try to raise and straighten the port at its entry. The suggestion made sense: all the modifications we made had, in effect, purchased a less abrupt turn at the valve at the expense of creating a bend that turned through more degrees. We'd traded a tight 45-degree pipe elbow for a long-sweep 90-degree fitting and were left with a net improvement that was as predictable as it was disappointing.

Frustration generated a strong urge to clamp the SR500 cylinder head in a milling machine and really take the kink out of that intake port. The urge still exists and may yet be indulged, but hasn't been at this writing. What we did do was stick with our original plan, which was to avoid changes likely to be beyond the capabilities of individual Yamaha owners. It's reasonable to expect that people will borrow or buy a small high-speed electric grinder and some rotary files; few of us have a Bridgeport mill and heli-arc welding equipment at our disposal. So we had to be content with raising the SR500 intake port just three millimeters, slicing that amount out of the roof and restoring roundness with clay on the floor. It wasn't much, but the cut wasn't enough to seriously narrow the gasket surface above the port face. By simply elongating the

(Continued on page 114)

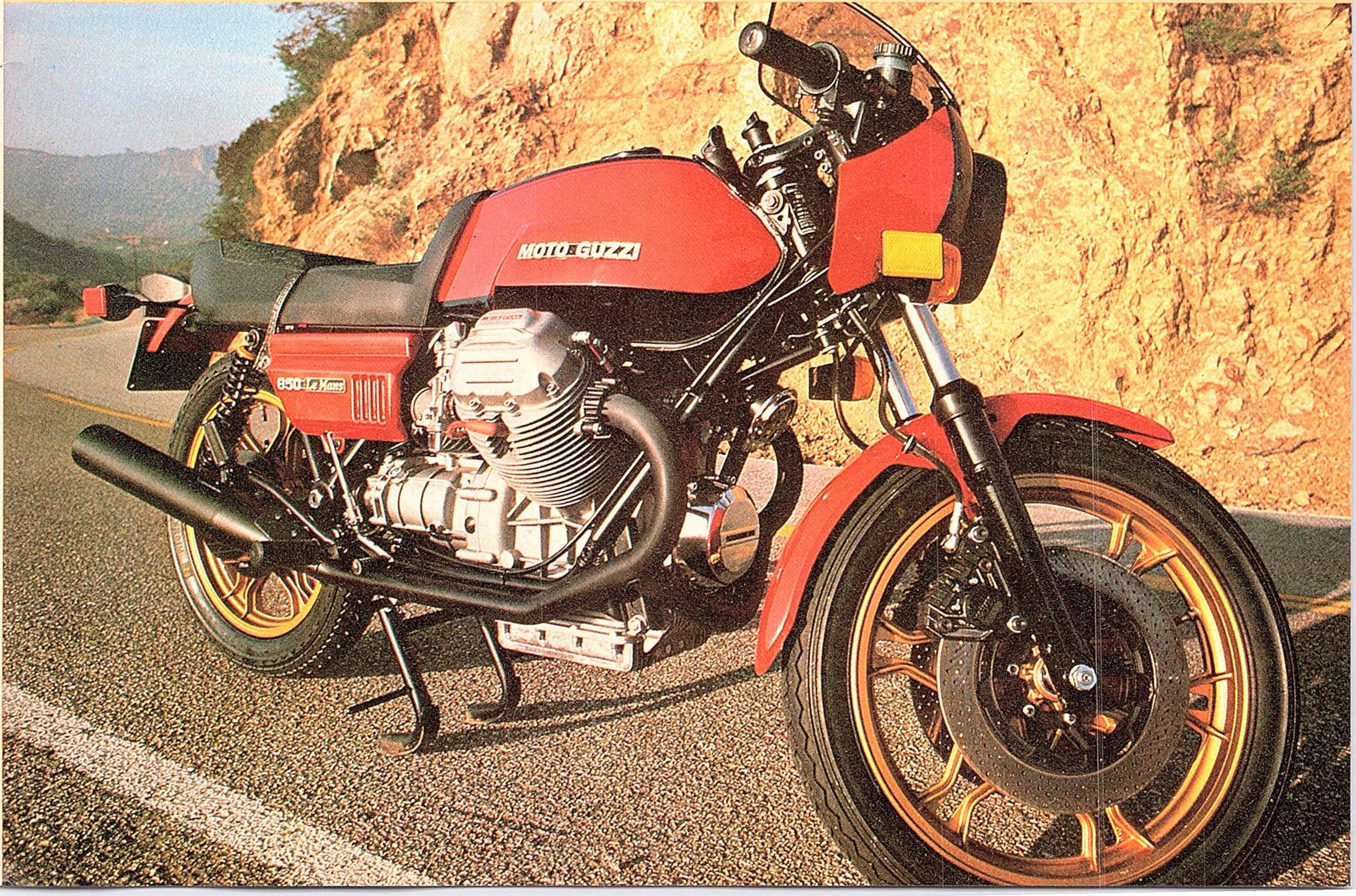
The California Specials

In a land where function is glorified, what you build reveals how you ride

● For the average rider, there's nothing wrong with showroom stock. But for the rider who wants to put his stamp on his motorcycle, the standard piece is merely a starting point. How you use your motorcycle dictates the shape the machine will eventually assume: if you're the circuit king of local A&W driveways, then yard-long leather handlebar streamers with rhinestone studding might be your idea of high-rolling fashion. Jim Woods, John Crowder, Howard Blau and Reg Pridmore don't see their motorcycles as hitching posts for windblown accessories. Their concerns are functional: more power, more traction, better handling and stronger braking, and their shaping process honors real performance; top to bottom, front to back.

Jim Woods is a certified Moto-Guzzi/Ducati fanatic; he's also a dealer for same in Glendale, California. Woods tweaks the standard LeMans by recurving the ignition advance, recalibrating the 36mm Dell'Ortos, and using an exhaust system less restrictive than stock. He suspension-tunes with 13-inch S&W 95/125 shocks, carefully massaged front dampers and reversed brake calipers. The firmed-up suspension minimizes the Guzzi's attitude changes produced by in-corner braking and throttle adjustments. Spray-magic transforms the stock alloy wheels to gold, an appropriate color for a $4199 machine that can make an impressive 12.85 sec/104 mph showing in the quarter mile.

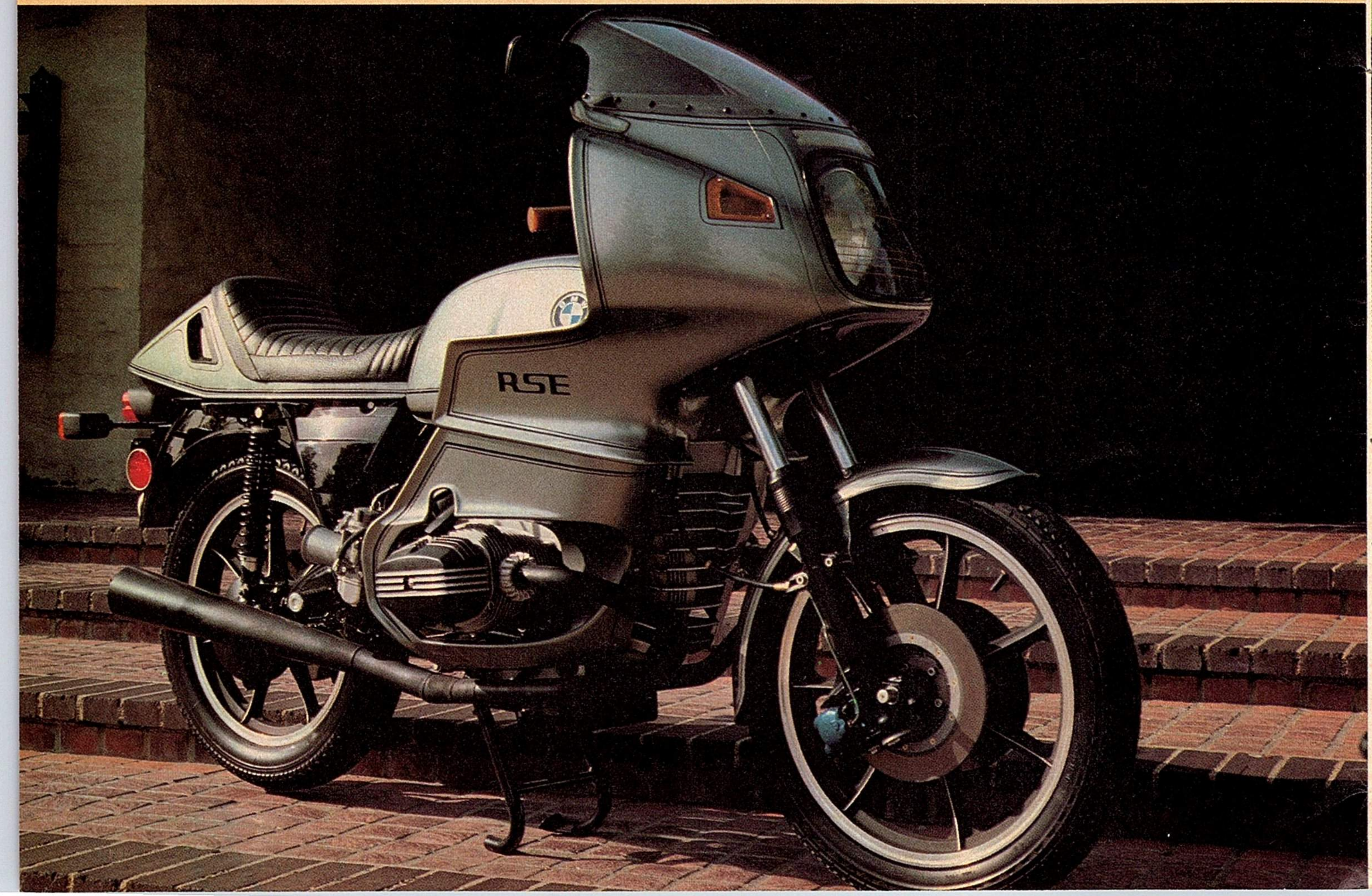
PHOTO: PAUL R. HALESWORTH



The California Specials

● Are you ready for a letter-game? Here's the RSE from RPM on BMW. The corollary is the number-game: This RSE will pull your bank balance into a $9000 list, matey. A word of explanation. Everyone knows BMW. RPM is shorthand for Reg Pridmore Motorcycles in Goleta, California. If you don't know who Reg Pridmore is, then take a look at the last three years of winners' circles in Superbike Production Racing, and report back here. RSE designates the special-order custom BMWs that Pridmore and Company assembles for its clientele; not every RSE has $3000 worth of options, and some may have only $100 worth of extras. RSE-type BMWs are super-performance street machines—not track racers. Ten- and eleven-second quarter-miles don't impress Reg; total around-town and over-the-road performance does. You can get anything you want at Reggie's Restaurant: Morris wheels; Plasma Products aluminum discs; S&W and Koni shocks; reworked front forks with alternative springs, spacers and dampers; custom rear-end drives; modified flywheels; high-compression 10.5:1 pistons; pointless ignition; cylinder heads in three stages, with altered port angles; modified cam followers; and custom paint. And more and more. Buying an RSE is more than fancy catalog optioning. At RPM you get to work with the man who literally wrote the book.

PHOTO: DAVE HAWKINS



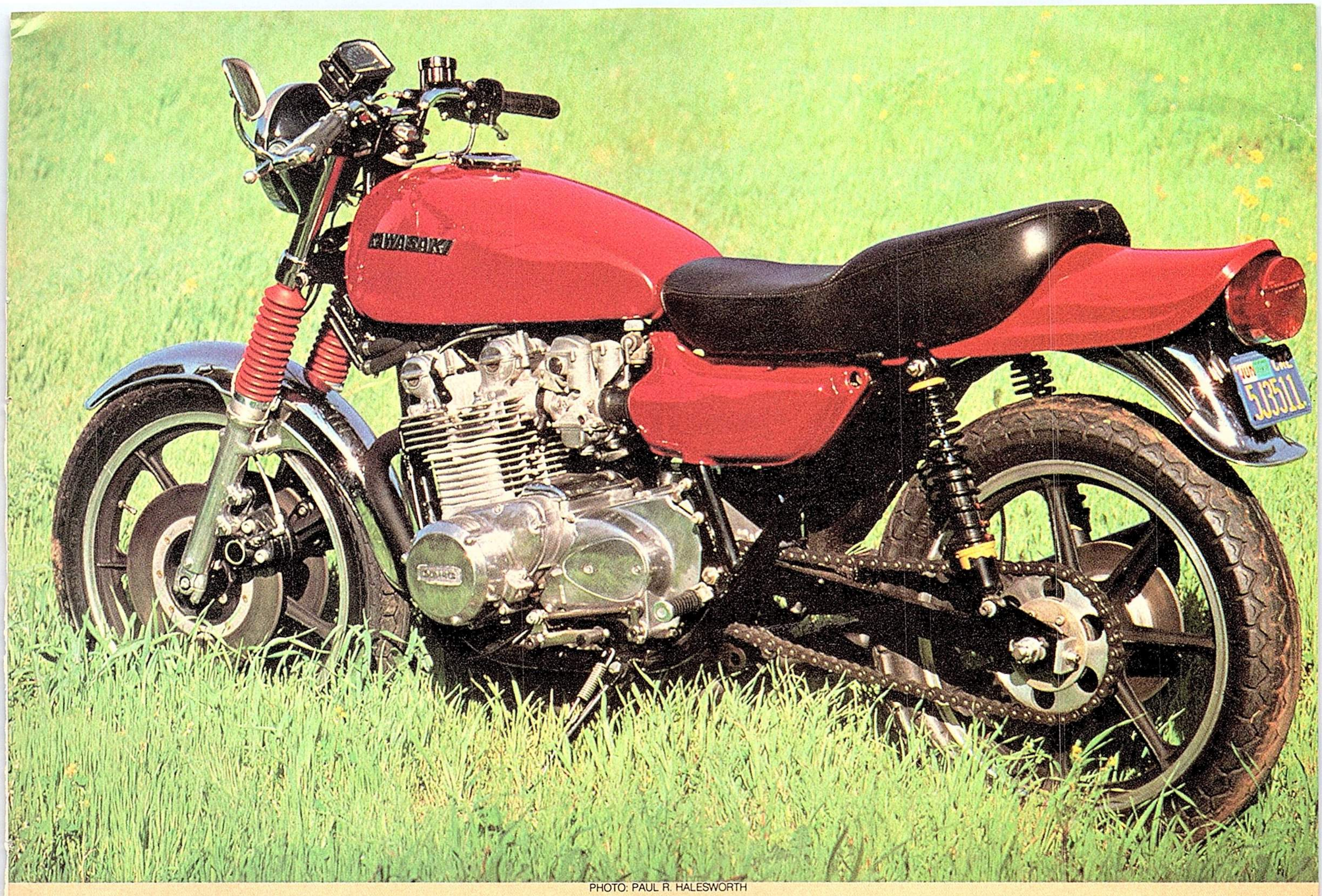


PHOTO: PAUL R. HALESWORTH

● When the heat's on at *Cycle* Magazine, the phone of Howard Blau, Attorney at Law, rings. In matters of Le Grande Ticket Traffica, Barrister Blau gives advice and counsel, an essential service for someone like Bart the Dart Mudflap (aka Bart Muhlfeld) who collects tickets like baseball cards.

Blau wanted a fast, comfortable, reliable roadster, so he took his 1975 Z-1 off to Pierre DesRoches, the tuner/constructor of *Z*uperbikes (Racecrafters, Vetter). Pierre built a street engine with tremendous low- and mid-range power: enough for 11.5-second quarters. The hardware includes Yoshimura 987 pistons, Bonneville cams, RC cam followers, 29mm Mikuni smooth-bore carburetors, and a special four-into-one exhaust with equal-length headers. There's a long toss-out list—electric starter, speedometer, superfluous wiring, etc. The frame has the DesRoches handling package. Ream-fit bolts and special plates tie the engine to the frame; additional tubes brace the steering head and lock the neck and swing-arm areas together; TrickIt front fork bearings are used with KZ650 triple clamps; front fork internals have been reworked; a C&J swing arm, one inch longer than stock, pivots in special bronze bushings. The obvious things are Hunt discs, BMW bars, Morris wheels, relocated pegs and special seat. Oh yes, Barrister Blau and Doctor John are friends. They make a perfect pair.

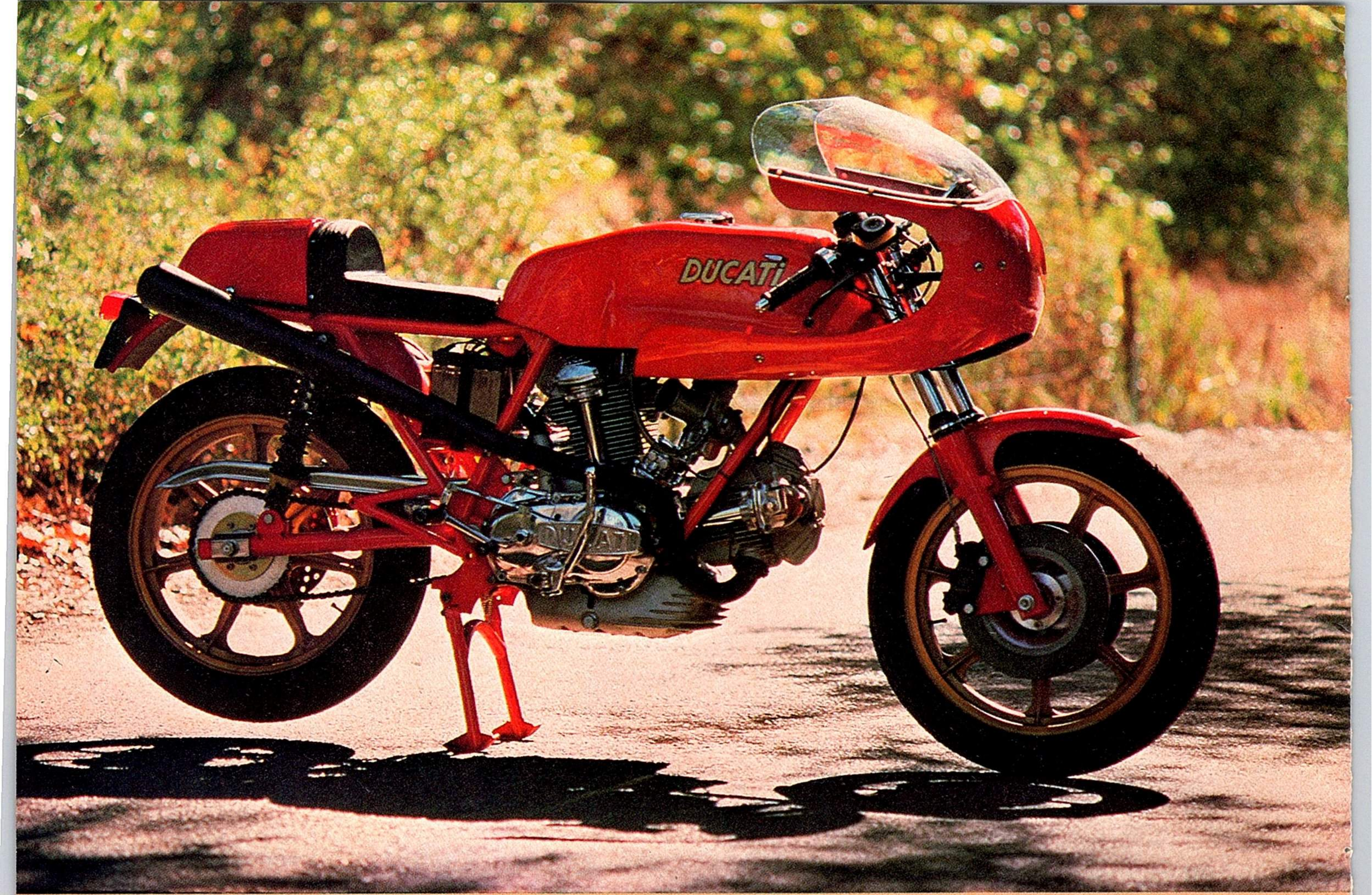


PHOTO: HOWARD BLAU

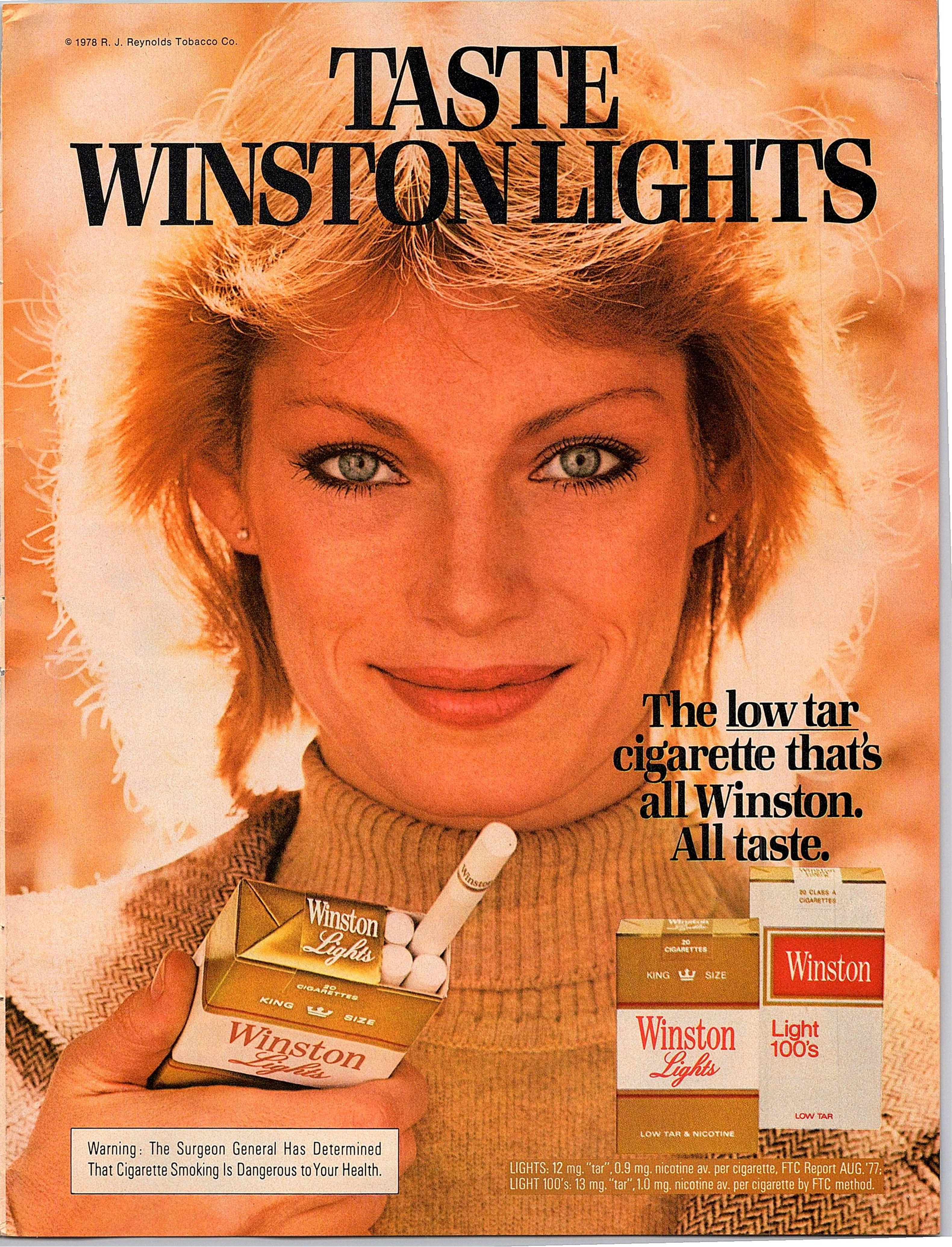
● John Crowder, a fast-moving physician from Santa Monica, has a 750 Ducati well-known to *Cycle* staffers—and, we suspect, to certain members of the California law enforcement establishment. Crowder's extravagant Desmo arose from a cloud of dust and shower of fiberglass chips. Once upon a time his then-stock-and-standard 750 touched a header pipe down and precipitated a scene of instant carnage, thus encouraging the good doctor to rebuild the consequent heap into a device fit for an operating room. If Italians were Germans, then something like Crowder's bike would have come off the Bologna production line.

No pacemaker has ever been better crafted, and all the right parts are right at home: Harry Hunt Aluminum discs, Lockheed calipers, braided steel hydraulic lines, S&W rear shocks and a solid-nose Camber fairing simply head the list of hardware finery. The detailing is staggering; you'll not find a single hard edge that's been rounded off. Every nut, bolt and spacer has been laboriously manicured. The paint? Perfection in red. Internally, Dr. John has left things as the factory set them. But the exhaust system is composed of Imola headers and custom-built megaphones, which honor street-decibel limits in the breach. There's no headlight, but then again, Crowder has never had trouble going fast enough to get home long before the sun sets on his red racer.◉

The California Specials

© 1978 R. J. Reynolds Tobacco Co.

TASTE WINSTON LIGHTS



The low tar cigarette that's all Winston. All taste.

Warning: The Surgeon General Has Determined That Cigarette Smoking Is Dangerous to Your Health.

LIGHTS: 12 mg. "tar", 0.9 mg. nicotine av. per cigarette, FTC Report AUG. '77;
LIGHT 100's: 13 mg. "tar", 1.0 mg. nicotine av. per cigarette by FTC method.

HO
750FOUR
K
HONDA

FIRST INTO THE FUTURE.

1978 Honda CB-750K: Ride a reputation into the future.

The 1978 Honda CB-750K glows with class. From its front disc brake to the tips of its four-pipe exhaust system, the 750K is the styling leader. With its powerful engine and sharp handling, no wonder it's the world's most popular Superbike.

Its throaty engine sound has no equal. Power comes from four cylinders displacing 736cc's. The eight valves are operated by a simple, single overhead cam. Fuel is metered through four synchronized Keihin carburetors, equipped with an accelerator pump for even snappier throttle response.

With five well-spaced gear ratios to select from, the 750K can poke through downtown traffic or stretch its legs on the interstate. (Even when you encounter that one monstrous hill that leaves some cars in the slow lane, a quick downshift and a little more throttle will put you easily over the top.)

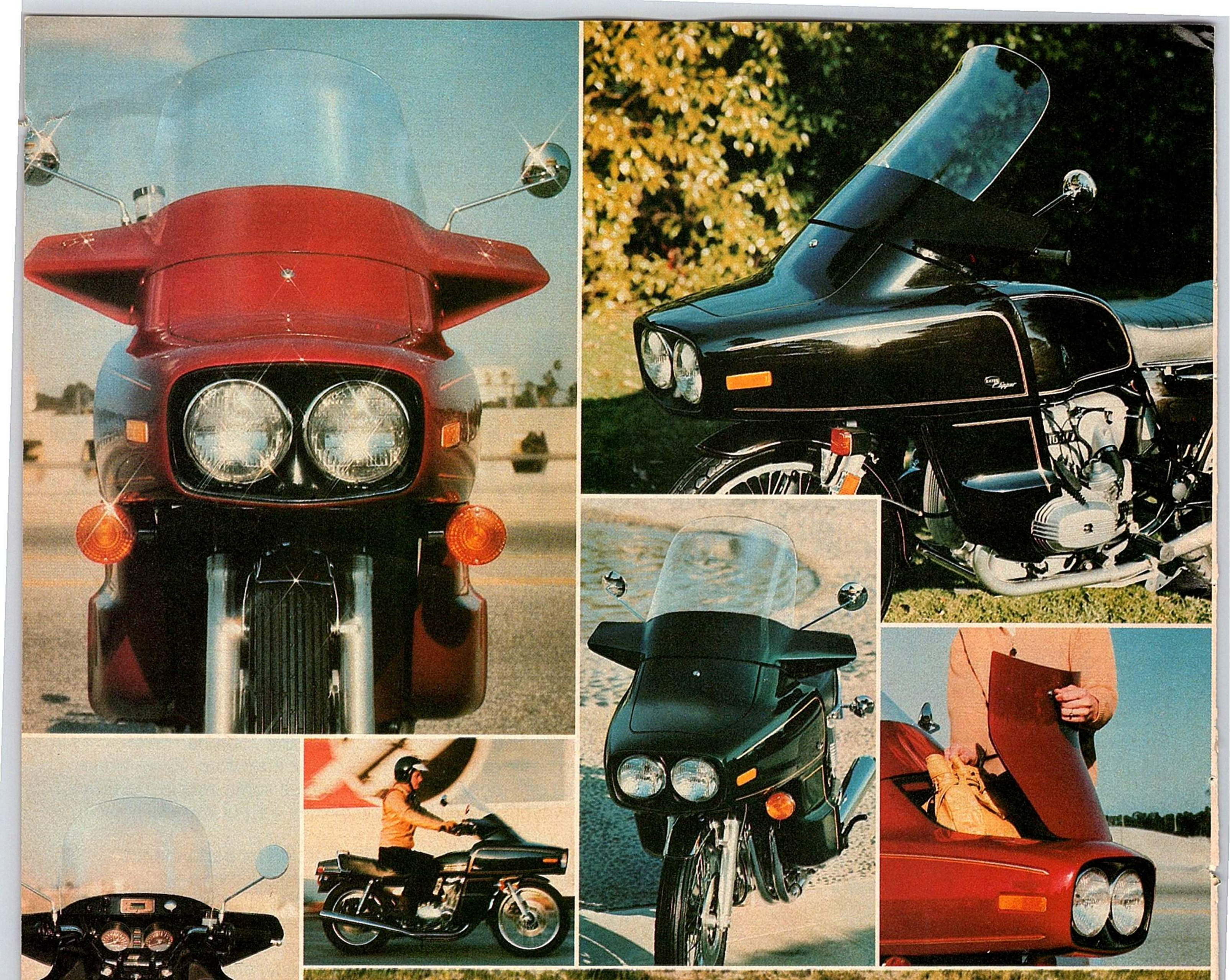
Yet the CB-750K refuses to sacrifice comfort for performance and styling. Careful engineering yields a complete package featuring two-stage padding in the stepped seat, full instrumentation, new front suspension with reduced static friction and special dual-stage damping shock absorbers that can handle small as well as harsh bumps with equal efficiency.

As the world's premier Superbike, the CB-750K has a reputation second to none. It has the performance, styling and heritage of a champion. See the 1978 Honda CB-750K now, at your Honda dealer. Ride a reputation into the future.

Always wear a helmet and eye protection, keep lights on and check local laws before riding. Model availability may be limited. For free brochure, write: American Honda Motor Co., Inc., Dept. C98K, Box 50, Gardena, California 90247. See Yellow Pages for nearest dealer. ©1978 American Honda Motor Co., Inc.

HONDA
GOING STRONG!

CIRCLE NO. 34 ON READER SERVICE PAGE.



Clippers available for Honda GL-1000 and 1978 CB-750K, Kawasaki KZ 1000, BMW R100/7 and Suzuki GS 1000.

Bates Clipper—it just raised the standard in fairings!

To see the Clipper is to want it, and to own one is to love it. That's what riders are telling us about their Clippers. And these are riders who know what touring is all about. To them, the Clipper has everything: Looks . . . see for yourself. Quality . . . the Bates name tells you that. Standard features . . . lockable storage in the sides and front, adjustable windshield height, removable lowers, striping. Optional features . . . custom colors, AM-FM radio, map light, cigarette lighter, digital clock. For complete information on the Clipper fleet and all other Bates Accessories and Leathers, send $2.00 for a full-color Catalog.

BATES INDUSTRIES, INC.

BATES®

the "quality people"

P.O. Box 240-CC
Long Beach,
California 90801
(213) 435-6551

Information service

How To Find What You Saw And Liked

Cycle Reader Brochure Service

Here's a listing of the latest in literature on commercially available motorcycle products. To receive any of the following materials, simply circle the number next to the item on coupon at right. Your request will be forwarded to the appropriate company.

(101) VETTER: Full-color catalog of complete 1978 line of motorcycle accessories.

(102) U.S. CYCLE TIRE: Twenty-three-page catalog of available tires, tubes, wheels and wheel kits; information about tire design, sizes and ratings, mounting, balancing and care.

(103) ITALJET: Four-color and black-and-white leaflets of specifications for complete line of junior motorcycles; Pack-A-Way moped; and children's riding clothing and safety apparel.

(104) KLOTZ: Leaflets describing four-stroke synthetic-blend motor oil for Hondas; questions and answers about synthetic four-cycle motor oil; legal/stock racing fuel pre-mix.

(105) HITACHI-MAXCO: Motorcycle chain interchange manual; 1978 consumer price list.

(106) ELECTRO HELMETS: Four-page color brochure of complete product line; consumer price list; decals.

(107) FIKAN: Black-and-white brochure describing product benefits of Chameleon back support; Wooly Bully seat cover; and Butt Bucket café seat.

(108) KAWASAKI: Four-page, full-color brochure of 1978 motorcycles with specifications chart.

(109) GUMOUT: Technical Bulletin "How to Keep the Fuel Flowing" with exploded-view drawings of carburetor operation and parts; Service Bulletin for motorcycle drive chains.

(110) CRAWFORD HOUSE: Four-color leaflet describing features of Frye Bike Rider's Boot.

For any of the above information circle appropriate number on a coupon at right! ➧

Here's how you can get additional information concerning products and services advertised in this issue, the New Products Editorial Section, and the listing on this page:

1. Clip one of the coupons. Print, or type, your name and address as indicated. Be sure to include Zip Code.
2. Please circle the number on the coupon which corresponds to the number at the bottom of the advertisement, New Product listing, or next to the item in our brochure listing on which you wish further information.
3. Enclose 25¢ to cover our processing costs. Your name will be forwarded to each company from whom you have requested further information: Listed companies will mail out literature as they deem appropriate.
4. Mail Coupon and 25¢ to: Cycle
   P.O. Box 2904
   Clinton, Iowa 52732
5. Allow 4 to 6 weeks for receipt of literature and information.

CYCLE, P.O. Box 2904, Clinton, Iowa 52732
EXPIRES November 30 1978 CC9/78

Don't Forget A Quarter For Processing **25¢**

Name__________

Address__________

City__________

State__________ Zip Code__________

For information on items circle numbers below. AC

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26
27	28	29	30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49	50	51	52
53	54	55	56	57	58	59	60	61	62	63	64	65
66	67	68	69	70	71	72	73	74	75	76	77	78
79	80	81	82	83	84	85	86	87	88	89	90	91
92	93	94	95	96	97	98	99	100	101	102	103	104
105	106	107	108	109	110	111	112	113	114	115	116	117
118	119	120										

☐ Please send me 12 issues of Cycle for $4.99 and bill me.

CYCLE, P.O. Box 2904, Clinton, Iowa 52732
EXPIRES November 30 1978 CC9/78

Don't Forget A Quarter For Processing **25¢**

Name__________

Address__________

City__________

State__________ Zip Code__________

For information on items circle numbers below. AB

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26
27	28	29	30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49	50	51	52
53	54	55	56	57	58	59	60	61	62	63	64	65
66	67	68	69	70	71	72	73	74	75	76	77	78
79	80	81	82	83	84	85	86	87	88	89	90	91
92	93	94	95	96	97	98	99	100	101	102	103	104
105	106	107	108	109	110	111	112	113	114	115	116	117
118	119	120										

☐ Please send me 12 issues of Cycle for $4.99 and bill me.

CYCLE, P.O. Box 2904, Clinton, Iowa 52732
EXPIRES November 30 1978 CC9/78

Don't Forget A Quarter For Processing **25¢**

Name__________

Address__________

City__________

State__________ Zip Code__________

For information on items circle numbers below AA

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26
27	28	29	30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49	50	51	52
53	54	55	56	57	58	59	60	61	62	63	64	65
66	67	68	69	70	71	72	73	74	75	76	77	78
79	80	81	82	83	84	85	86	87	88	89	90	91
92	93	94	95	96	97	98	99	100	101	102	103	104
105	106	107	108	109	110	111	112	113	114	115	116	117
118	119	120										

☐ Please send me 12 issues of Cycle for $4.99 and bill me.

Ride Longer And Like It On A Travel Ease Water Cushion

There's nothing like it for long range riding comfort. Why? No other manufacturer has utilized (then improved on) the unique water bed principle in a bike seat.

Eliminates Pressure Points - Hydraulic principle equalizes support wherever it touches.

"New Seat" With Every Shift - Shift your weight. The plastic foam and water adjusts to fit your new position like a mold.

Vibration Stops at the Water - Talk about "damping affect" -- the water isolates you from tiring road vibration.

"His and Hers" Adjustment - Separately adjustable chambers provide individual two-up comfort.

Highly Recommended - by articles in the following magazines: CYCLE WORLD, RIDER, BIG BIKE, STREET BIKE, MOTORCYCLIST.

Fits Most Bikes - Attaches in seconds without tools to these 250 through 1000 cc. makes: BMW, Honda, Moto Guzzi, Kawasaki, Suzuki, Yamaha, Norton, Triumph, Ducati and BSA.

One Time Investment - The water cushion attaches to existing seat and therefore can be transferred from your old bike to your new one.

Only $29.95. - Send the name and model of your bike with a check for $29.95. We will ship your TRAVEL EASE WATER CUSHION postpaid within 48 hours.

JML Products INC
Department C • Box 17808
Milwaukee, WI 53217 414/352-8848
Dealer and Distributor Inquiries Invited

malcolm smith

GOLD MEDAL
GOGGLE AND FACE MASK

COMPARE THE QUALITY TO ANY OTHER AND DISCOVER THE GOLD MEDAL DIFFERENCE.

Frames and masks available in blue, red, yellow or white.

Clear, amber or smoke $12.95
Polaroid $16.95
Mirrored-Polaroid $17.95
Six Tear-offs $1.95
Face Mask $7.95

FOR OUR NEW 1978 CATALOG SEND $3.00 TO: DEPT. C MALCOLM SMITH M/C, 7563 INDIANA, RIVERSIDE, CA 92504, OVER 100 PAGES OF ACCESSORIES.

SR500E HOP-UP .... *Continued from page 108*

stub manifold's mounting holes we shifted the manifold upward to match the relocated passage, and we assumed even this slight change would tell us if more ambitious port-straightening efforts would be rewarded.

All the clay had to be scooped out of the port prior to this final assault on the metal and carefully reapplied when the grinding and buffing was done. The whole process was a bit of drudgery we'd happily leave to the servants (if we had any), but on this occasion the tedium was amply rewarded. The flow was up at all lifts, rising to 123.7 CFM at .400-inch, and reaching 126 CFM at .500-inch, which were rates comfortably above baseline. Flow was also appreciably better than before the port entry was raised three millimeters, and this has us wondering what miracles of breathing might be possible if we opted for a more radical modification along the same line. Converting to short Harley-Davidson XR750 valve springs would provide room for a quarter-inch elevation of the spring seat pocket; the space created could be used to tilt the port centerline into a downdraft relationship with the valve. It would almost be worth all the machining and heli-arcing to see what would happen to the flow.

We found some fairly significant things happening to the SR500's intake flow just with the changes we did make. The most important discovery was that flow at very low valve openings could not be greatly improved except at the cost of intolerably depressing high-lift flow. A two-CFM gain at .050-inch lift became a 20-CFM loss at .500-inch lift when we added a thin, rounded ring of clay to create a slight venturi above the valve seat. On the other hand, all of the successful changes made farther upstream from the valve gave better flow at all valve openings, with especially large increases beyond the point (.250-inch lift) at which the stock port began to offer serious resistance. After we'd finished our work, the SR500's intake port would flow air at rates closely tied to valve lift up to .350-inch, where the area of the valve/seat aperture equalled the seat throat area. Openings beyond .350-inch lift produced diminishing returns: the flow rate at .400-inch lift is only 2.5 CFM lower than that at .500-inch and just 4.25 CFM less than the .600-inch lift maximum of 127.6 CFM.

The above data makes it clear that flow through the *Cycle*/Yamaha intake port is not much influenced by the presence of an intake valve hovering a half-inch from its exit. Once the valve head moves more than .400-inch away from its seat, flow proceeds almost as though the valve had been removed. We tried that, flowing air through a completely unobstructed port, and the reading we got verified something we'd been told: that when port and valve shapes are properly matched, completely removing the valve actually will cause a

1978 CYCLE BUYERS GUIDE

MOTORCYCLES — Specifications index list 171 models classified by street, dual-purpose, and off-road categories • MINIBIKES—Comparison index, photos, descriptions—for beginners, advanced riders, and junior racers • MOPEDS—Exclusive list of 48 models, specifications, and photos • CYCLE TESTS—17 road and dirt bikes including Honda CBX, Kawasaki Z1-R, Suzuki GS-1000, and Yamaha XS Eleven • TEN BEST BUYS OF 1978—Zeroes in on ten best bikes, road and dirt, based on price, performance, service, and all around value. It's the whole bag—**your** next bike is here! Order from CYCLE BUYERS GUIDE, P.O. Box 278, Pratt Station, Brooklyn, N.Y. 11205. Enclose $3* (postage and handling included). *Residents of CA, CO, DC, FL, IL, MI, MO, NY STATE, TX, and VT add applicable sales tax.

Simichrome polish

America's No. 1 selling cycle polish . . . imported from Germany. Excellent for aluminum, magnesium, chrome — all metals.

Available at your favorite cycle shop. If not, order direct — $2.05 per tube, 3 for $6.00

DEALERS: Write for FREE sample.

COMPETITION CHEMICALS
P.O. Box 141 • Iowa Falls, Iowa 50126

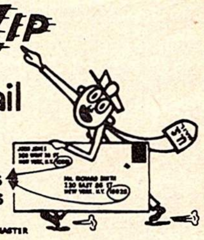
ROAD RACERS — CAFE RACERS
RD350/400, Honda, Kaw, Suz & others

Road Race/Cafe fairings, seats, tanks, pipes, tires, RR boots & gloves, Special tools & hardware, racing brakes and many other hard to find items.

New 1978 Catalog $1.00

Racers Supply, Dept Cycle
6959 Van Nuys Blvd., VN, CA. 91405

PUT ZIP in your mail



Include ZIP CODE NUMBERS IN ALL ADDRESSES

THE FINEST MOTORCYCLE CLOTHING IN THE WORLD

Langlitz Leathers

The finest custom made leathers for the pleasure or sport rider. Factory direct only. Catalog available.

Send $1.00 for NEW CATALOG
(Refund on first order)

2443 S.E. DIVISION, PORTLAND, ORE. 97202

KAWASAKI CITY

High Performance
PARTS and
ACCESSORIES

COMPLETE MACHINE SHOP SERVICE

2 & 4 Stroke • Boring
Turbocharging • Resleeving
Rebuilt Crankshaft Exchange
111 N.E. Union • Portland, OR 97232
(503) 233-8478

INTRODUCING
THE KRYPTONITE®
MOTORCYCLE LOCK
IT'S A STEAL

It cannot be cut by bolt-cutters, files nor hacksaws, nor forced open with a jack.

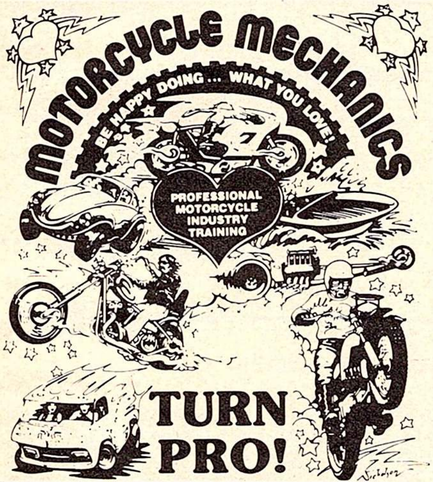
- Fully hardened alloy steel construction.
- High security 7-pin tubular lock.
- Unique double locking mechanism secures both ends of the shackle.
- Compact and light—ideal for touring.
- Fully coated with thick vinyl.

Ask for it at your dealer or send $39.95 plus $2. (for postage and handling) to:

KRYPTONITE®
95 Freeport Street
Boston, Ma. 02122

Dealer and distributor inquiries invited
Reader Service No. 64

LEARN IT ALL... THE PROFESSIONAL WAY!


MOTORCYCLE MECHANICS
BE HAPPY DOING... WHAT YOU LOVE!
PROFESSIONAL MOTORCYCLE INDUSTRY TRAINING
TURN PRO!

Learn it all — the Professional way, with NTI Industry Training Systems. NTI is a professional vocational institution dedicated to building super talent in motorcycle mechanics and related fields.

Approved for Veterans

Call: (301) 277-2286
An Accredited Institution

NATIONAL TECHNICAL INSTITUTE
4810 Calvert Road; College Park, Maryland
NAME
ADDRESS
STATE ZIP
AGE PHONE
☐ MARRIED ☐ SINGLE ☐ I AM A VETERAN

slight decline in the flow rate. The valve *stem* simply does not exist from the air's perspective. A lump of clay had been used to seal the valve guide while open-port flow was checked; removing the clay and stabbing the inverted valve into the guide put the stem down in the port, and there was absolutely no change in the flow reading. Jerry told us that was a common characteristic in smooth-flowing ports, adding that the Yamaha valve's shape must be awfully good. He said some valves stall intake flow so badly that readings jump upward as much as 25 per cent when they are removed from the port. In such instances he can get large improvements by using a different valve; he didn't think we could hope to better Yamaha's lightly tuliped valve-head shape.

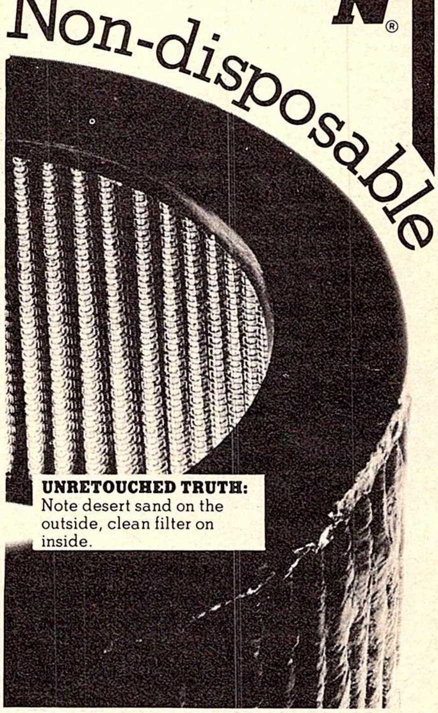
The final stage of our porting project was to measure very carefully the shape that had developed during the days of changes and flow tests. The clay would have to be replaced with epoxy before we could try our fancy, revised port on the engine dyno, and we didn't want to rely on memory alone in reproducing the bench-developed shape. Also, we wanted to check the cross-section areas at various points through the port. The entry diameter had been held at 35mm but the port interior's dimensions were unknown, having been generated as we carved and clayed according to the dictates of the flow bench. So the head was chilled in a refrigerator to harden the clay, and we made numerous measurements—which were then transferred onto graph paper as scale cross-section drawings. Simply counting the graph paper squares gave us the areas, and an interesting fact: the flow bench had chosen a virtually constant-area shape. The port was round at its entry and widened to 48mm where it turned downward toward the valve, but the steadily increasing width was offset by a reduction in height. The areas did increase around the valve guide, immediately upstream from the valve seat throat, which has a 41mm diameter and thus a larger area than the 35mm port entry.

Where do we go from here? There's a lot more graph paper in our future, because the next step is to continue with plotting lift curves from as many Yamaha 500-banger cams as we can find. The results of our dyno tests would seem to indicate that something very near standard Yamaha valve timing will give us best overall horsepower. Flow test numbers tell us to look for a cam profile that pushes the intake valve out to .500-inch lift or a little more and pushes it fast. If we use the half-inch lift the SR500 still will be six CFM below its projected air requirement, but that's a lot better than the 22-CFM shortage estimated for the stock setup. Being 4.5 per cent behind in your breathing is nothing when you've started with a 16.5 per cent deficit. Maybe this Yamaha SR500 hop-up project of ours is getting somewhere after all. ◉

CLEAN AIR PERFORMANCE
FILTERS
FOR ANY VEHICLE!
Motorcycle, car, on-or-off road. Send $2.00 for catalog.

Box 1329, 561 Iowa
Riverside, Ca 92502
(714) 682-8813

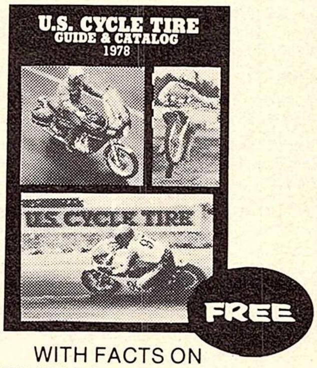
K&N®



UNRETOUCHED TRUTH:
Note desert sand on the outside, clean filter on inside.

CIRCLE NO. 28 ON READER SERVICE PAGE.

AT LAST! A COMPLETE TIRE GUIDE & CATALOG



WITH FACTS ON
- MOUNTING
- BALANCING
- RATINGS
- TIRE CARE
- DESIGN & CONSTRUCTION
- ACTUAL MEASURED SIZES

THE MOST COMPLETE SELECTION OF MOTORCYCLE TIRES IN U.S.

CALL OR SEND FOR FREE TIRE GUIDE & CATALOG
CALL TOLL-FREE
800-521-4350
IN MICH. CALL 313-334-2070

U.S. CYCLE TIRE

DEPT C98 BOX 659 PONTIAC, MI 48056

NAME
ADDRESS
CITY
STATE ZIP

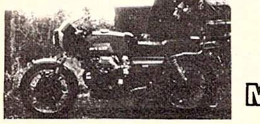
Cycle MARKET PLACE

REGULAR CLASSIFIED: COMMERCIAL RATE: For firms or individuals offering commercial products or services. $2.10 per word. Minimum order $31.50. **EXPAND-AD® CLASSIFIED RATE:** $3.15 per word. Minimum order $47.25. **ILLUSTRATED CLASSIFIED RATE:** $75.00 per column inch. Must be used in conjunction with either Regular or Expand-Ad® classified. Frequency discount: 5% for 6 months; 10% for 12 months paid in advance. **PERSONAL RATE:** For individuals with a personal item to buy or sell $1.15 per word. **DISPLAY CLASSIFIED:** 1" x 1 col., $115.00; 2" x 1 col., $230.00; 3" x 1 col., $345.00. Col. width 2-1/4". Advertiser to supply film positives. For frequency rates, please inquire.

COLOR: Color avail. for all classified ad styles at earned rate plus additional 25%. Color choice Publisher's option & subject to availability. Publisher reserves right to run ad in black if color not avail. on classified pages. In such cases color charge will be refunded or credited. **GENERAL INFORMATION:** All copy must be typewritten or clearly printed. Payment must accompany copy except when ads are to be billed on credit cards — American Express, Diners Club, Master Charge, VISA — or ads are placed by accredited advertising agencies. First word in all classified ads set in caps. ALL copy subject to publisher's approval. All advertisers using Post Office Boxes in their addresses **MUST** supply publisher with permanent address and telephone number before ad can be run. Ads are not ackowledged. They will appear in first issue to go to press if received after closing date. Closing Date: 3rd of the 2nd month preceding cover date (for example, March issue closes January 3rd). Send order and remittance to Classified Advertising, **CYCLE,** One Park Ave., New York 10016. For inquiries, contact Karen Ross at (212) 725-3926.

FOR SALE

MOTO GUZZI



EUROPE ON A MOTO GUZZI

- Overseas delivery arranged for all Moto Guzzi models.
- Guzzi gives the rider unparalleled performance, reliability, safety and style.
- Stand apart from the rest—Start your European tour in Italy with a new Moto Guzzi.

For details, contact:

RON LEVY LTD., *Overseas Delivery Agent*
238 Mulberry Street, New York, NY 10012
(212) 288-5282

VELOCETTE

KSS, 1947 $2500 and Thruxton, 1969 $2500. Both original and excellent mechanical order. Prices firm. James Sitz, 2100 Panamint Drive, Los Angeles, CA 90065.

MISCELLANEOUS

FREE WHOLESALE CATALOG: Motorcycle, Snowmobile, Small Engine parts, accessories, fiberglass supplies Manufacturer's Supply, Box 157-C, Dorcheser, WI 54425.

BUILD a 152 mph Daytona proven Suzuki 750 water-pumper street bike. Catalog $1.00. Plans $25.00. Earley Engineering, Box A3230, Chicago, Ill. 60690.

CLASSICS. Ariel, Matchless, Norton, Triumph, Velocette. Prompt replies. Classics Unlimited, 2121 Arlington, Caldwell, Idaho 83605. (208) 459-8786.

FROGGEYE PEARLS — Show car finishes — new Toludine Red Candy Apple. Lockwood, 3401 Troost, KC, M.O. 64109. (816) 753-8055, closed 2 pm.

PUBLIC AUCTION, 200 antique motorcycles September 24, Orange City Fairgrounds, Costa Mesa, California. Buyers/Sellers write: VMA, Inc., Box 3526, Long Beach, California 90803. (213) 433-4704.

ACCESSORIES

WINDJAMMER-SS $269 PLUS OPTIONS

TOTAL PRICE WE PAY SHIPPING

SEND CHECK OR MONEY ORDER: STATE YR., MAKE, MODEL, OPTIONS & COLOR (BLK, WHT, SIL). CALIF. RES. ADD 6%.

HORNS + $19.95 VENTS + $8.95 QUARTZ LIGHT + $19.95
STRIPING + $9.95 LIGHTER + $3.95 TALL SHIELD + $3.95
LOWERS — PLAIN $64.95 — WITH STRIPING $69.95

PARTS UNLIMITED 13273 Glenoaks Bl.
SYLMAR CALIFORNIA 91342 (213) 367-1246

BELL HELMETS

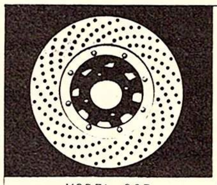
TOTAL PRICES!

WE PAY SHIPPING

CALIF. RES. ADD 6% TAX SEND CHECK OR MONEY ORDER — NO COD'S
STATE: STYLE, SIZE (6¾-7¾) AND COLOR CHOICE

RT	MAG II	STAR 120	MOTO	STAR II
$45.95	$65.95	$73.95	$73.95	$81.95

PARTS UNLIMITED-Dept. C, 13273 GLENOAKS BL.
SYLMAR, CALIFORNIA 91342 (213) 367-1246



MODEL 207

DRILLED DISCS REDUCE AQUAPLANING AND WHEEL WEIGHT

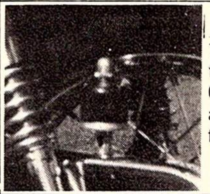
CUSTOM DRILLED DISCS ADD A DISTINCTIVE PERSONALIZED TOUCH

WRITE FOR INFORMATION

NELMAN FABRICATORS
P. O. BOX 1085
SPRINGFIELD, VA 22151

108 HOLES IN YOUR DISC. Return prepaid airmail for $29.95 M.O. Bill Bowman, Inc., 2546 Manhattan Ave., Montrose, CA 91020.

ACCESSORY MART. 1978 Catalog Weighs over two pounds. 360 8-1/2" x 11" pages of parts, accessories, tools for British, European, Japanese and vintage bikes. $3.00, refundable. P.O. Box 26116, Cincinnati, Ohio



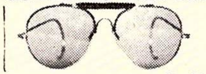
CHAIN-SPROCKET WEAR?

Tired of messy sprays? Ride worry free! Automatic adjustable Drip Oiler. Minimizes wear, adjustments and splatter. Easy to install. Write for info. or send $24.75 to:

CHAIN LUBE PRODUCTS
Box 11589, Raytown, MO 64138

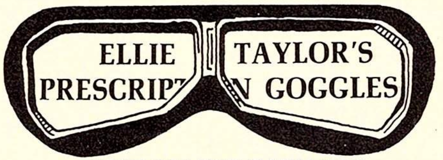
APPAREL

SUNGLASSES → as low as 5.65 ea.



Stop plucking bugs from your eyes! These glasses give full eye coverage plus cable earpieces to keep them from flying off your face! Brow bar keeps perspiration off the lens. Triple-braced wire frame. Free carrying case. Impact-resistant GLASS lens in choice of Grey, Green, Brown, Mirror, or Yellow. Fast delivery and money-back guarantee if not satisfied. Prices: 6.95 for 1 pair, or 11.95 for 2 pair, or 16.95 for 3 pair. Add .45 per pair for parcel post, or .75 per pair for Air Mail. Foreign orders add 1.25 per pair. Order from:

HIDALGO SUPPLY CO., DEPT. 8
P.O. Box 35339 Houston, Texas 77035



SEND 25¢ FOR CATALOGS
P.O. Box 5023 • Santa Barbara, Calif. 93108

SAVE 15 TO 30% WITH

Goggleman

SCOTT • UVEX • CARRERA
CLIMAX • SUPER SEER • STADIUM
Send 25c for latest GOGGLOG
ELLIE TAYLOR'S GOGGLES
PO BOX 5023-C
SANTA BARBARA, CALIF. 93108

LEATHERS PARR OF ARIZONA
Dept. 46
3903 N. 16 St.
Phoenix 85016

NEW! Send 50¢ in coins for COLOR PHOTO CATALOG of Made to Measure LEATHERS. SHIRTS, JEANS, JACKETS, CHAPS. Contour Cut to FIT! Tall, Big, & Athletic builds - satisfaction guaranteed since 1954.

phone orders 602-266-4861

FINEST QUALITY LEATHER motorcycle jackets, shirts, pants, boots, belts, gloves, vests, helmets, raingear. World's lowest prices. Immediate delivery. Catalog 25 cents. Herm's Leathertogs, Dept. C, 701 Northampton St., Easton, Pa. 18042

BUSINESS OPPORTUNITIES

NEW LUXURY CAR Without cost. Free Details! Codex-ZZ, Box 6073, Toledo, OH 43614.

MILLIONS IN MAIL! Free Secrets! Transworld-17, Box 6266, Toledo, Ohio 43614

CLUBS

THE THIRD WHEEL, INC., largest sidecar club, largest annual rally. Sample newsletter, registration form. P.O. Box 1111, Mpls., Mn. 55440.

CYCLE PUBLICATIONS

Road Rider

The only motorcycle magazine published solely for the touring rider. $10.00 for 12 issues, or send $1.00 for a sample copy to: P.O. Box 678, Dept. E, South Laguna, CA 92677

NEW CATALOG & MANUAL $2.50

NORRIS cycle cams

"FOR ALL REASONS"

1711 N. El Camino Real
San Clemente, California 92672

EMBLEMS/PATCHES

EMBLEMS EMBROIDERED. Rush your design, free quotation. Order five or 500. Also stock all emblems - Yamaha - Honda - Triumph - Suzuki - $3.98 each. Stadryc - 6 Ave - Whitestone, New York 11357.

INSTRUCTION

MOTORCYCLE MECHANIC TRAINING in the Valley of the Sun. Basic and advanced courses. Student loans. Approved for veterans. Motorcycle Mechanics Institute, 2644 East Bell Road, Phoenix, AZ 85032. (602) 971-9727.

SMALL ENGINE MECHANIC 9 month program. Learn cycle, outboard, snowmobile. Write Dan Richter, Admissions. WISCONSIN INDIAN HEAD TECHNICAL INSTITUTE, New Richmond, Wisconsin 54017.

EQUIPMENT AND PARTS

HONDA MOTORCYCLES AND PARTS ARE CHEAPER IN CENTER, TEXAS. Honda parts 10% off Honda retail prices. When ordering parts please give us Model, Year, Frame Number and Engine Number. Honda engine high performance specialist. HAYDEN HONDA, P.O. Box 829, Center, Texas 75935. Phone (713) 598-2330 and 598-2322.

TRIUMPH & BSA

Parts. Mail Order Service Worldwide

111 Sunrise Highway
Amityville, N.Y. 11701
Call 516-842-5771

CYCLE CITY Inc.

HONDA PARTS ONE DAY MAIL WORLDWIDE

State Model No., year, frame & engine nos.

NEW 80pg CATALOG $1

($1.50 by Air Mail anywhere in the world.

Call TOLL FREE
800-645-6066
(except NY. Hawaii & Alaska)
or 516-248-5775

HONDA of MINEOLA
336 Jericho Tpke., Mineola, N.Y. 11501

BSA Parts
Kawasaki Parts

SHIPPED SAME DAY

NORFOLK MOTORCYCLES
Box 81, Rte 1A
Norfolk, MA 02056
Call (617) 384-7555

CALL TOLL FREE
FROM ANYWHERE in U.S.A.
800-221-7508

GENUINE HONDA PARTS
24 HR. MAIL UPS SERVICE
OUR 50th ANNIVERSARY
State Year. Model. Eng. & Frame Nos.
Our New Parts & Access. Cat. Avail. Send
$1.00 for Postage & Handling. $1.50 for Air.
9920 Farragut Rd., Bklyn. 11236
N. Y. State CALL: 212-257-0230
Division of Carl's Motorcycle Sales, Inc.

CARLS HONDA

GUARANTEED
USED PARTS
Save 50% or More

Japanese, British & European parts. Try us for obsolete & hard-to-find items. Give: Make, Model, Year, and I.D. #.

BARONG MOTORCYCLE SALVAGE
3031 ADELINE STREET • OAKLAND, CA. • 94608

Norton TRIUMPH BSA

USED & RECONDITIONED PARTS

CYCLE SALVAGE, INC.
172 Frontage Road, West Haven, CT 06516 (203) 933-1609

RECYCLEDCYCLES

EASTERN CYCLE SALVAGE, INC.

Two floors of good USED PARTS for most makes and models. Save up to 50%. One day service.

WRITE:
DEPT. C, 87 PARK STREET
BEVERLY, MASS. 01915 (617) 922-3707

Norton PARTS

NATIONWIDE
Mail Order Service
Route 109
Millis, MA 02054
(617) 376-2679

MILLIS CYCLE
Closed Sun. & Mon.

FORKING BY FRANK

Fine fork tubes, any length for any bike, including stock & under. Engineered to duplicate the oil circulation in stock suspension systems. Precision machined to fit & work like stock. Freight paid reliable delivery. Also tweek bars, springs, boots, kickstands, conversion kits, extended speedos, & SAE approved brake hoses.

FRANK'S MAINTENANCE & ENGINEERING, INC.
945 Pitner Evanston, Ill. 60202
(312) 869-6792

KAWASAKI • BMW NEW OLD • TRIUMPH

PARTS & ACCESSORIES MAIL ORDER COD
Specializing in Machine & Speed Work. Full Crank Rebuilds • Boring • Porting • Complete Engine O/H

H-1/H-2 Crankshaft Cylinders
Reconditioned on Exchange

Send for Free Catalog. Include $1.00 for Handling

VISA **arlington MOTOR SPORTS** master charge

1098 Mass. Ave., Arlington, MA 02174 • (617) 648-1300

TRIUMPH BSA

PARTS: from '47 on . . .

-G.P. Cycle Works. . .4721 Telegraph Ave. . .Oakland, CA 94609
-(415)658-9844
-State: Make, Model, Year, I.D. No.

HONDA NORTON BSA HARLEY YAMAHA TRIUMPH MOTOGUZZI KAWASAKI SUZUKI

GUARANTEED
USED PARTS
Honda Kawasaki Yamaha
Suzuki Triumph

All parts guaranteed in Good Condition

½ LIST PRICE 1-DAY SERVICE M/C, B of A

Write or call. Give make, model, yr., frame #

ALL MOTORCYCLE PARTS
20059 ROSCOE BLVD., WINNETKA, CA. 91306 (213) 998-1168

SAVE ON NEW parts. Approximately half of list on used parts. Most makes and models available. Cycle Salvage Center Sales, R.R. 3, Beatrice, NB 68310.

HONDA YAMAHA

USED & RECONDITIONED
PARTS
CYCLE SALVAGE, INC.
172 Frontage Road, West Haven, CT 06516 (203) 933-1609

Kawasaki SUZUKI

DICK'S ROYAL ENFIELD WEST

PHONE:
(714) 629-6674

Mail Order Parts, Shop Manuals, etc.
Largest Stock in U.S.A.—Tell us your needs today!
702 W. Holt, Pomona, CA 91768

Indian MOTORCYCLE PARTS

Order from the Official Source
INDIAN PARTS U.S.A.
946 Spencer St., Syracuse, NY 13204
315-474-4555

CALL TOLL-FREE FOR HONDA AND KAWASAKI
PARTS & ACCESSORIES

America's Largest Phone-Order Parts Service

800-423-5662

WEST COAST SAVINGS

BankAmericard & Master Charge

ORDERS FILLED IN 24 HRS.

Allyn's Honda/Kawasaki
958 N. Maclay
San Fernando, Calif

HARD TO GET

TRIUMPH BSA Norton YAMAHA

PARTS AND ACCESSORIES
Largest stock in U.S.
24 Hour Mail Order Service
Dealers Welcome

DONELSON CYCLES, INC.

Nationwide except Missouri
call 800-325-4144
Missouri call:
(314) 427-1204
3328 Woodson Road
St. Louis, MO 63114

BSA **TRIUMPH** NORTON
BMW (USA Only)

PARTS SHIPPED NATIONWIDE DAILY
NEW — USED — RECONDITIONED
No Catalog — Just Tons of Parts

TRIUMPH OF OKLA. CITY
1824 N. MACARTHUR (405) 947-7831 Okla. City, Okla. 73127

COSMOPOLITAN MOTORS, INC.
HATBORO, PA. 19040

24 HOUR SHIPPING
PARTS-ACCESSORIES
Rebuilt Engine Exchange
(215) 672-9100

Benelli
Riverside
Parilia
MV Agusta
Franco Morini
Marzocchi
Pirelli
Sidi-Boots

Barrufaldi
Dellorto
Regina Chain
ND Plugs
AGV Helmets
Borrani Rims

Catalog - $1.00

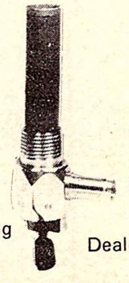
SACHS PARTS by mail order

★ **Repair, Restore your DIRTBIKE** ★

Largest, most complete stock of Sachs Engine parts for: Penton, Sachs, DKW, Monark, MCB, Am. Eagle, Dalesman, Tyran, Saracen, with 100/125cc 5- or 6-speed Sachs engines. Send $3 for parts book and $4 for factory repair manual. Fast service!

SPEEDCENTER, U.S.A Bin 101 **(714) 979-4122**
3001 Red Hill Ave., Costa Mesa, CA 92626

"QUALITY PERFORMANCE PRODUCTS"
motorsport INC
P.O.BOX 831, PALATINE, IL. 60067 312/359-4990



RESERVE VALVES

FOR:
Sportster,
74,
Kawasaki,
Triumph
&
Custom
Gas Tanks

Send $1.00 for Catalog Including Other Race & Street Products

RACE VALVES

High
Volume
In
Small
Compact
Design

Patent Pending

Dealer Inquiries Invited

FREE PARTS CATALOG! Name Brands — Low Prices. Write: Road Work, 5550 W. Dakin, Chicago, IL 60641.

Indian • ROYAL ENFIELD
PARTS BY MAIL ORDER

Repair, restore, or customize your Enfield!

★ USA's largest, most complete stock of over 2,500 different parts (all new) for all '52-'70 models! Lucas, Girling, Amal, Renold, Smith parts also available. Send $5 for parts books and $6 for repair manuals. Specify year, model, engine and frame numbers on all orders for parts, manuals. Fast service! ★

SPEEDCENTER.U.S.A. Bin 101 (714) 979-4122
3001 Red Hill Ave., Costa Mesa, CA 92626

Road Touring Catalog

Hundreds of road touring accessories to keep you riding in comfort and style from the touring specialist at Lynnwood Honda.

Order your catalog today and get in on our special touring buys.

Windjammer SS.	From $289.95
Vetter Vindicator.	From $249.95
Oil Filters, (4 cyl. Honda) 10 or more .	Each.79

Please enclose $1 to cover postage & handling.

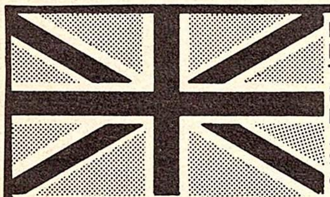
Lynnwood Honda

P.O. Box 1214 20307 Hwy. 99 Lynnwood, WA 98036

Name

Street

City/State Zip



NORTON
BSA AJS
TRIUMPH
RICKMAN
LUCAS
AMAL
SMITHS
GIRLING

BRITISH MOTORCYCLE PARTS

LARGEST STOCK IN THE USA master charge BANKAMERICARD

CALL FREE 800-854-0493 (EXCEPT CA)

British Spares Ltd.

P.O. BOX 6192 ANAHEIM, CA 92806 714-635-5802

EMPLOYMENT INFORMATION

WORLDWIDE EMPLOYMENT OPPORTUNITIES. All Occupations! $10,000 — $50,000+. Free Information! Employment International, Box 29217-WW, Indianapolis, Indiana 46229.

ROCKY MOUNTAIN EMPLOYMENT NEWSLETTER!! Colorado, Idaho, Montana, Wyoming! Free details . . . Intermountain-2Y, 3506 Birch, Cheyenne, Wyoming 82001.

SERVICES

CYLINDER REMANUFACTURING, Liner replacement in any cycle engine. Specialists in sleeving Chrome bores, Two Strokes & Antiques. Piston Grinding. High Grade cast iron sleeves custom manufactured to meet your exacting requirements. Fast, reliable service, reasonable prices. Small Engines Machine Works, Inc., 2217 N. Vancouver, Portland, Oregon 97227. (503) 284-6983.

COMPUTERIZED Motorcycle Evaluation. The "Systems Reliability" of your motorcycle analyzed. Free sample! Computer - CK, Box 415-B, Brooklyn, N.Y. 11230.

GOVERNMENT SURPLUS

U.S. GOVERNMENT SURPLUS DIRECTORY. How, Where to buy 100,000 items (including Jeeps) . . . low as 2 cents on dollar! Most complete information available . . . $2.00. SURPLUS DISPOSAL, Box 19107-WW, Washington, D.C. 20036

PERSONALS

CONDOMS BY MAIL!

Sample Pack, Only $3

Your choice of the **best** men's contraceptives Trojans, ribbed Texture Plus with "Pleasure Dots." Bold 45™ world's first colored condom with texturing. Stimula and 32 other brands. Plain, attractive package assures privacy. Service is fast and **guaranteed.** Sample pack of 12 condoms, $3. Catalogue alone: 25¢ **Over 500,000 satisfied customers.**

Write today: POPLAN, P.O. Box 400, Dept. CY9-F
403 Jones Ferry Rd. Carrboro, N.C. 27510

MAKE FRIENDS WORLDWIDE through international correspondence. Illustrated brochure free. Hermes-Verlag, Box 110660/Z, D-1000 Berlin 11, Germany.

VACATION/TRAVEL

GUIDED MOTORCYCLE TOURS — America's magnificent Southwest on touring-equipped 750cc motorcycles. Interested? Motorcycle Tours of America, 2921 Carlisle NE, Albuquerque, NM 87110.

MISCELLANEOUS

IDENTIFICATION CARD, catalog, send stamped addressed envelope. NIPCOF, 303 E. Main, Barstow, CA 92311.

CORVAIR PARTS — 4500 item, giant catalog rush $2.75. Clark's Corvair Parts, Shelburne, Mass. 01370. (413) 625-9092.

NEVER VOTE For Lawyers Club. Send one dollar for membership and sticker. Jack Smith, Box 91C, Mineral Wells, West Virginia 26150.

POEMS, SONGS WANTED. Songs recorded-published. Radio released. Broadway Music Productions, Box 7438-CM, Sarasota, FL 33578.

CLASSIFIED ADVERTISING ORDER FORM

1	2	3
4	5	6
7	8	9
10	11	12
13	14	15
16	17	18
19	20	21
22	23	24
25	26	27
28	29	30

Please refer to heading on first page of this section for complete data concerning terms, frequency discounts, closing dates, etc. WORD COUNT: 15 WORD MINIMUM. Include name and address.

Words ____________

$2.10 (Commercial Rate)
$3.15 (Expand-Ad Rate)
$1.15 (Reader Rate)

☐ Insertions ____________
☐ Enclosed is $ ____________
☐ CHARGE: You will be billed monthly.
  ☐ American Express ☐ Master Charge
  ☐ Visa ☐ Diners Club

Account # ____________

Expiration Date ____________

Master Charge Interbank # (4 digits above name)

SIGNATURE ____________
PRINT NAME ____________
ADDRESS ____________
CITY ____________ STATE ____________ ZIP ____________ CY-978

Advertiser's Index

Service No.		Page No.
	Accessory House	112
	Alka-Seltzer	97
	American Honda	7
34	American Honda	110–111
	American M/C Institute	35
	American M/C Mechanical School	10
	American M/C Schools, Inc.	119
93	American PJ Company	32
40	Amural	47
	Big Four Distributors	41
	Blue Magic	86
	Bridgestone Tires	85
	Buchanan's Frame Shope	122
	Calvert/Kessler	21
	Chrysler/Plymouth	61
	Clinton Cycle	86
	Competition Chemical	114
	Consumer Co-op	10
	Cycle Warehouse	92
33	Dick's Cycle West	122
	Drag Specialties	95
42	General Motors/Chevrolet	51
	Goodyear Tire	4
	Goodyear Tire	123
36	Harley-Davidson	69
	Hi-Q	70
	Honda of Mineola	42
	Hooker Headers	90
41	Jardine Headers	100
	J.C. Whitney	11
	JML Products	114
39	Kawasaki	75
	Kawasaki City	114
80	Kerker	1
28	K & N Eng.	115
	Kool Cigarettes	14–15
	Kryptonite	115
	K V Products	103
	Langlitz Leathers	114
	Lee Co.	99
44	Lester Tire	58
46	Lockhart	88
	Malc, Smith Racing Prod.	114
	Marlboro	49
32	Martek	100
	Martek	84
	Maxim Lock Co.	103
21	Moto Guzzi/Premier Motor Corp.	82–83
	National Systems	52
	National Technical Inst.	115
62	NGK	6
31	Nippondenso	62–63
	North American School M/C Repair	52
	Phantom Rider	59
	Population Planning	86
29	Powers Electronics	89
	Powroll Performance	122
	Product Design Group	122
	Racecrafters	103
	Racers Supply	114
	Radiators Specialties	88
	R.C. Engineering	91
	R.J. Reynolds/Winstons	109
	R.J. Reynolds/Salem Lights	C-3
	R.J. Reynolds/Real	23
	Rough-Rider	86
48	S & W Engineering	8
	Seagrams 7 Crown	13
	Sharper Image	9
	Suzuki Fun Center	119
35	Tex-All	84
50	Tracy Nelson Design	103
22	Triumph	C-2
	United Motors Corp.	100
	U.S. Army Recruiting	19
	U.S. Cycle Tire	115
88	U.S. Suzuki	2–3
	VDO Instruments	92
52	Vetter	C-4
91	VIP Products/Armorall	87
	Yoshimura	10

BIMOTA SB2 .... Continued from page 32

provement." It has handling integrity the limits of which cannot be explored on the street, no matter how much of a Harry Hotspur you consider yourself to be. Its tires (a matched set of late-model Michelins, only one of which is, to our knowledge, DOT-approved), its suspension settings, its weight distribution, its geometry, its wheelbase length, its cornering clearance and the strength of its frame all work together to provide handling response and stability that's beyond our critical expertise. As hard as we could ride it, on the fastest, meanest roads we could find, it remained at the end what all of its technical ornamentation promised at the beginning: perfect.

Which, when you get right down to it, it damn well ought to be, considering the price. This raises an interesting question: does the SB2 really belong on the street? There are those who feel that motorcycles which cost close to $8000 complete, and can do what the SB2 can do, belong only one place: the racetrack, where they can knock heads against other $8000 motorcycles, carry riders who are worthy of the motorcycles' designers and builders and live life at the edge. The bike has been built for absolute, maximum speed. For it to be happy there, its creators have made it their business to do perfectly those things which are important at the limit, and *only* at the limit. This is what makes the bike so expensive: a dime buys you 20 mph, but high style at 130 costs quite a bit more.

You can spend the money it takes to own a Bimota, all right—the folks at Moto Sport will be only too glad to help you—and you can own the Bimota chassis, and the Bimota fiberglass, and the Bimota suspension, and that obsessive Bimota attention to the infinitesimal. But unless you ride the bike hard, you've bought Bimota parts without having achieved ownership of the real thing. Going faster than you've ever gone before, and feeling safer than you've ever felt doing it, is what justifies spending $6500 for some fiberglass, tires, wheels and cleverly welded chrome-moly. The racetrack is the only rational place to do that sort of thing—and purists would argue that the racetrack is where the Bimota belongs.

Others, less doctrinaire and less pure, would disagree. Motorcycling, they would say, is for fun; owning something like the Bimota, even if it never turns a Michelin in anger, would be wonderful fun. To be close to that kind of conceptualization; to possess the product of detail work bordering on the microscopic; and to have in your very own garage a motorcycle that can do what the Bimota can do—that's *fun,* on or off the racetrack. ◉

PIPELINE .... Continued from page 16

passenger to enter and find his kart-type bucket seat forward of the engine.

Once seated, Biland's passenger, Ken Williams of England, assumes a passive state of coexistence, able only to waggle his head from side to side and lacking freedom to perform feats of acrobatic daring. It was Williams' inactive role that sparked the "Ban Biland" clamor from a section of the sidecar competition. The Beo would, the opponents cried, strip sidecar racing of its essential spectacle, alienate spectators and present Biland with an unfair advantage—when he won. In fact, the anger may have been contrived, for anyone looking ahead might well have conceived of the Beo—or something similar—appearing on the horizon.

When Eric Oliver unwrapped his Norton-Watsonian "kneeler" in 1954, he started one thing that led to another. The machines became lower and lower as mini-car racing wheels and tires took over. In time, some brave souls started to experiment with wild adaptations of car suspensions with variable results, usually discouraging. But later on, hub-center steering and transverse suspension were developed to the point where they superceded leading-link forks and rear swing arms, which had been the rage for years. And throughout the process of experiment, more and more passengers found they could spend longer in the chair than out, especially when stability was improved with a steerable third wheel.

Since 1966 it has been fairly obvious that someone would eventually get a "three-wheeled car" as right as it could ever be and would therefore create a sidecar racing revolution. At the moment, *the* thing is Biland's dreaded Beo, although, significantly, the Swiss transports a back-up conventional machine to the GP circuits "just in case."

The most unreal thing about the Beo is its price. Reputedly it cost $19,000 to put the three wheels on the tracks. That seems like a disproportionately high investment to win a relatively unimportant world championship. But cost and controversy are well down Biland's list of priorities; his main concern is the need to win, and apparently there are enough sponsors of like mind to turn his ambition into reality.

With three sidecar GPs over, and Biland victorious in all three of them (one win was on his conventional rig), the FIM is being urged to cool the controversy by ruling on the Beo. If they find in its favor, they'll make lots of enemies among the sidecar crews. If they attempt to qualify their own rules and pronounce the Beo illegal, Biland will be proved guilty only of the crime of winning.

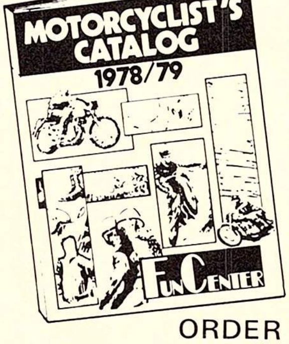
A cynic might say that since the so-called sidecars have no obvious connections with motorcycles—what the hell are they doing in motorcycle racing anyway?

—*Jim Greening*

Start an exciting career as a . .
MOTORCYCLE MECHANIC
AMS "THE CALIFORNIA SCHOOL OF THE PROFESSIONALS"

AMERICAN MOTORCYCLE SCHOOLS, INC.
GO WITH THE WINNERS !
If you're serious about becoming a top-notch motorcycle mechanic you'll want the best possible training available. You can't afford second best and neither can we. If you think you have what it takes to become a *professional . . .*
Call Toll Free 1-800-423-4678
Calif. Residents Call Collect (213) 944-0123
------------ OR MAIL COUPON ------------
☐ RESIDENCE SCHOOL ☐ HOME STUDY
AMERICAN MOTORCYCLE SCHOOLS
10025 Shoemaker Ave. • Santa Fe Spgs, Ca 90670
NAME______________________AGE____
ADDRESS__________________________
Street City State Zip
PHONE ___________________________ CY9

FREE Catalog



The most complete mail order catalog of accessories, clothing, performance equipment and replacement parts for all makes and models.
ORDER YOUR COPY NOW!
(213) 849-7295
FunCenter
515 N. Victory Blvd., Burbank, Calif. 91502
Please send me a FREE copy of the 1978-79 MOTORCYCLISTS CATALOG. Enclosed is $1.00 to cover the cost of postage & handling.
NAME (print) . . . .
ADDRESS . . . .
CITY . . . .
STATE. . . . . .ZIP. . . . .
*Add $2.00 for Foreign countries.

It's a black day for

other 750 4-strokes.

Pity the competition.

Bad enough they have to contend with Suzuki's super-fast GS-750.

Now they have to face the super-fancy GS-750E.

As you can see, it flaunts the blackest paint job this side of midnight. It also sports such fancy plumage as mag-style wheels. Dual-passenger custom seat. Twin disc brakes up front. And high-performance tires.

Power is supplied by a 4-cylinder Dual Overhead Cam engine that boasts 12-second quarters. But, despite the beastly power, you can expect infrequent trips to the gas pumps. And you can expect long trips between pumps thanks to the 4.8 gallon tank.

Six-inch traveling front forks and 5-way adjustable rear shocks soak up the bumps. And to help make our 750 the best handling bike in its class, there's a swingarm that pivots on needle bearings.

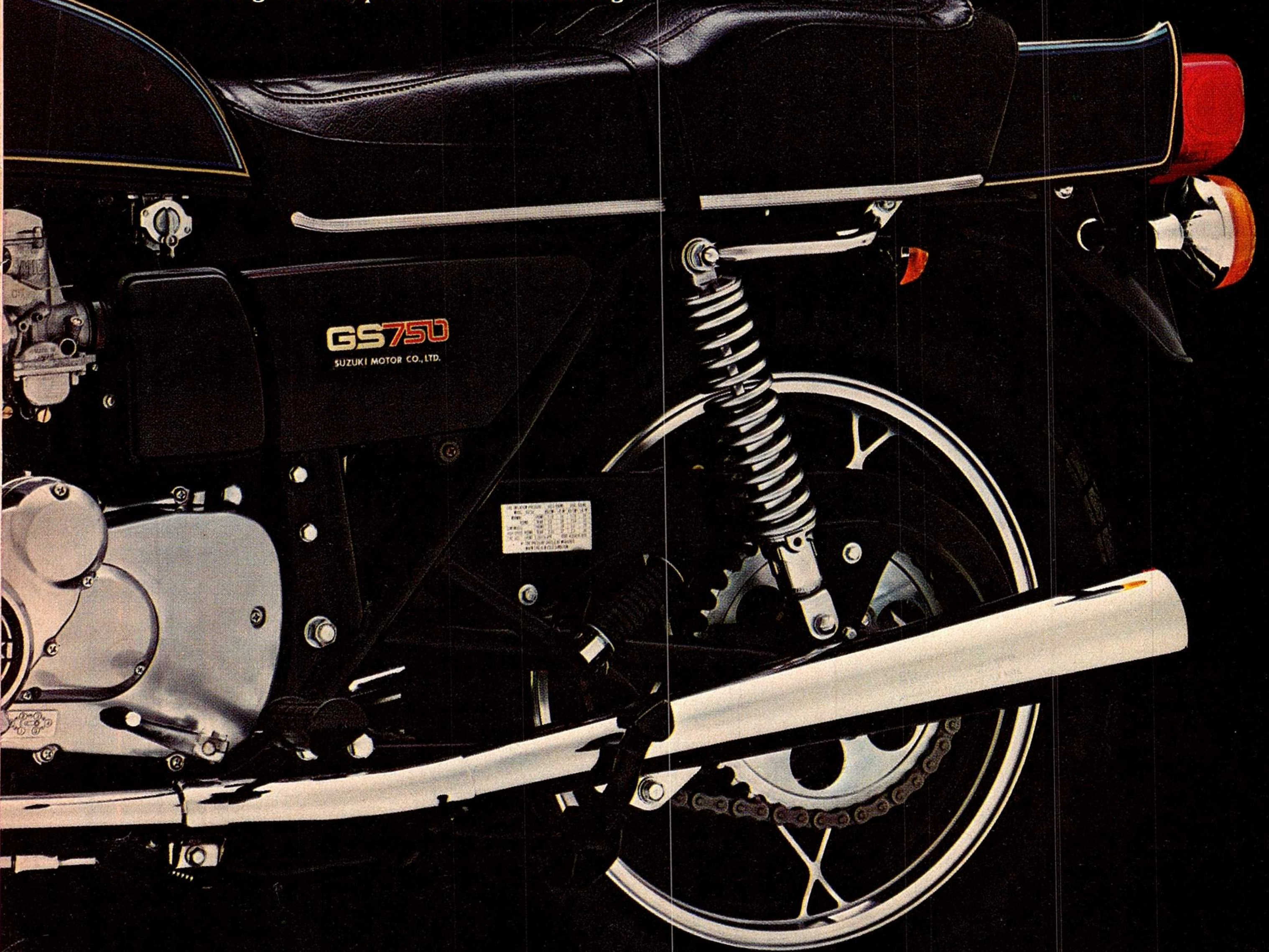
Electronic digital indicator tells you what gear you're in. And a tach that redlines at 9000 rpm tells you what gear you should be in.

No need to fret about adjusting the cam chain because it self-adjusts automatically. Nor is there need to worry about leaving the 750E in a parking lot. Because it comes with a new combination ignition and steering lock.

Now you know why this black beauty is making our competitors see red.

SUZUKI

The Fast One.



Ride safely: wear a helmet, eye protection and appropriate riding apparel.

CIRCLE NO. 30 ON READER SERVICE PAGE.

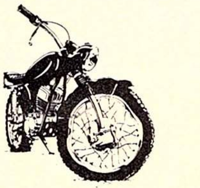
SUZUKI PE175 .... *Continued from page 82*

motorcycle manufacturers' patents on these items. As a result, most Team riders have added aftermarket folding levers.

In all respects, Suzuki designers have executed nicely the finishing touches. Both fenders are extra wide for particularly muddy areas. The 15-watt headlight has a high/low beam and a rock guard to protect the lens, and the light was sufficient for play riding at night though more light would be needed for night racing. An austere-looking but functional odometer/trip meter is provided; no speedometer is attached because it's not necessary for competition. Additionally, the designers developed an excellent quick-change throttle assembly which allows installation of a new cable in little more than a minute.

A large skid plate that's stock on the PE is especially effective in rocky terrain; in muddy areas, the plate shovels up a pound or two of dirt, and owners may opt to weld on a bar-type case protector.

With the PE175, Suzuki has proven that it has the capability of producing a bona fide enduro bike. For most enduro riders the amount of power is perfectly acceptable, and its wide powerband and gradual throttle response makes the bike easy and enjoyable to ride. Other owners who want more horsepower can find it in the powerplant's internals, ready to be tapped. Above all, the PE's first-rate handling characteristics make it easy, fun and safe to ride fast. ◉



We Solve Frame, Fork and Wheel Problems.

- Spoke Manufacture.
- America's largest source of spokes. Tell us what hub and rim you have. We will furnish the spoke you need.
- Expert frame straightening.
- Complete wheel lacing service.
- Send 50¢ today for catalog.

BUCHANAN'S

FRAME SHOP • 629 E. Garvey Ave. • Monterey Park, Calif. 91754 • (213) 280-4003

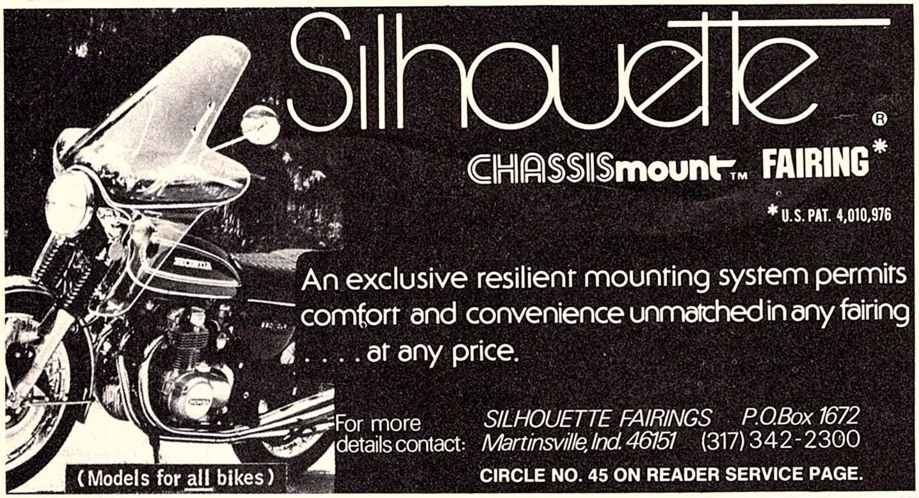
HOW MUCH GET UP AND GO GETS YOU UP?

The four-stroke specialists at POWROLL think you should have no less than you want. It's there. It's yours.

Send for our 1978-79 Complete Performance Fact Book and Catalogue, yours for $3 postpaid. Discover the exact components for highest performance of your engine.

POWROLL PERFORMANCE PRODUCTS, INC.
Shevlin Park Road
P.O. Box 1206 CG9
Bend, Oregon 97701
503/382-6395

High Performance Four-Stroke Specialists
HONDA • YAMAHA • KAWASAKI • SUZUKI
POWROLL MIC



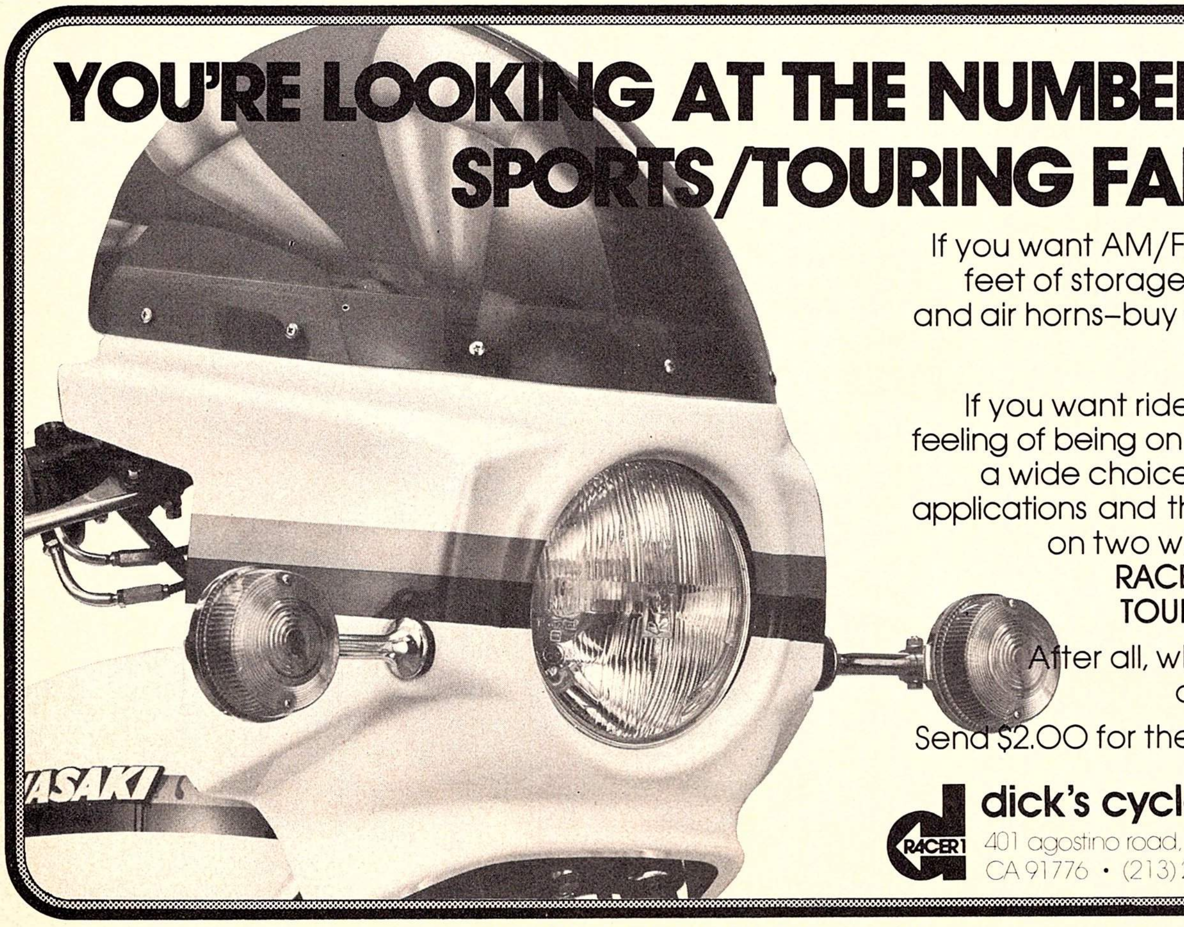
Silhouette®
CHASSISmount™ FAIRING*
*U.S. PAT. 4,010,976

An exclusive resilient mounting system permits comfort and convenience unmatched in any fairing . . . . at any price.

For more details contact: SILHOUETTE FAIRINGS P.O.Box 1672 Martinsville, Ind. 46151 (317) 342-2300

(Models for all bikes)

CIRCLE NO. 45 ON READER SERVICE PAGE.



YOU'RE LOOKING AT THE NUMBER ONE SPORTS/TOURING FAIRING!

If you want AM/FM/CB, 7 cubic feet of storage, running lights and air horns–buy an 18 wheeler.

HOWEVER

If you want rider comfort, the feeling of being on a motorcycle, a wide choice of handlebar applications and the sexiest look on two wheels–buy the RACER 1 S.2 SPORT/TOURING FAIRING.

After all, why do you ride a motorcycle?

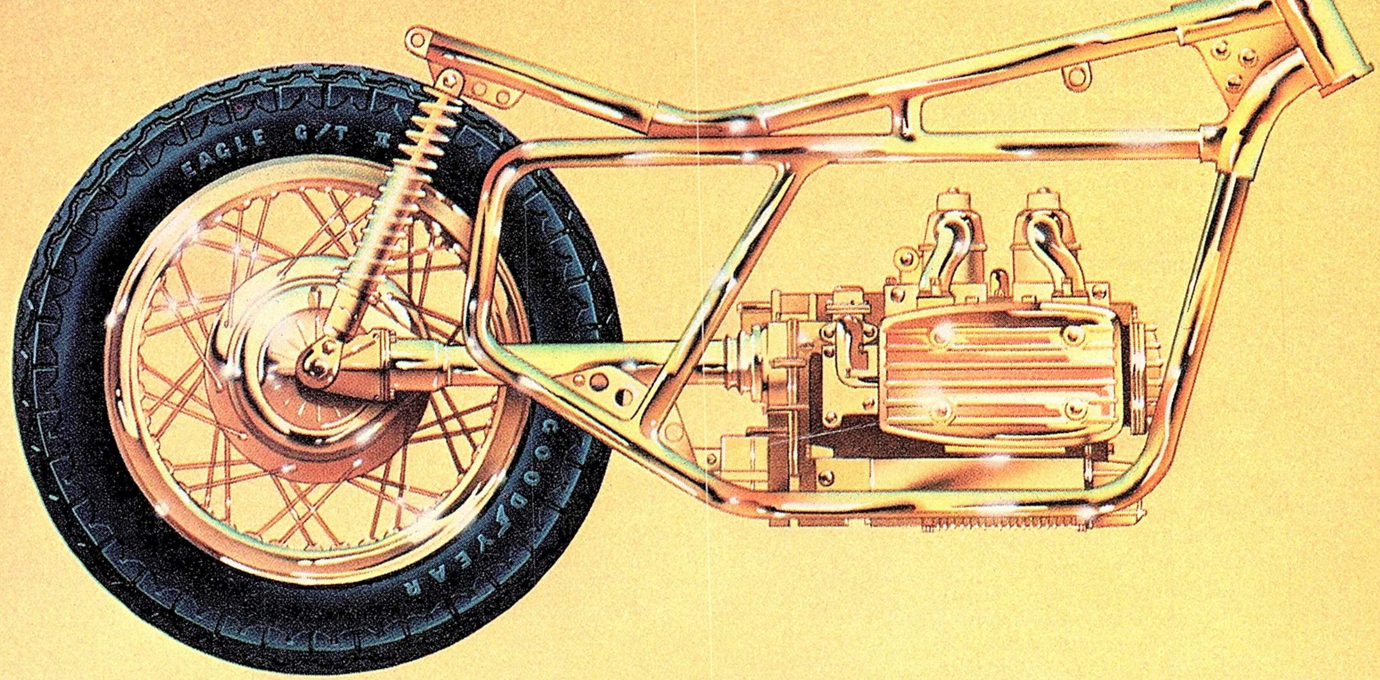
Send $2.00 for the 1978 catalog.

RACER 1
dick's cycle west, inc.
401 agostino road, San Gabriel,
CA 91776 • (213) 287-9656

CIRCLE NO. 33 ON READER SERVICE PAGE.

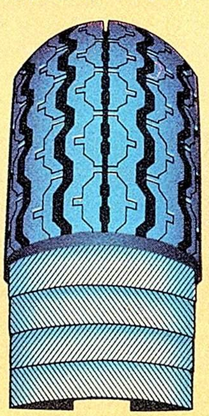
EAGLE G/T II

Built to run with a great design

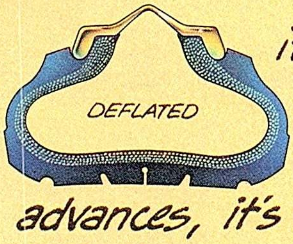


The power starts in the cylinders and moves fluidly through the gearbox to the rear wheel in a wide, precise band of power. This is a velvet-smooth giant of a motorcycle. This is touring design. But all this design innovation depends on the tire's footprint, a few square inches where the power is turned into motion. At Goodyear we know that. That's why we built the Eagle G/T II to run with this great design. Here's how it works.

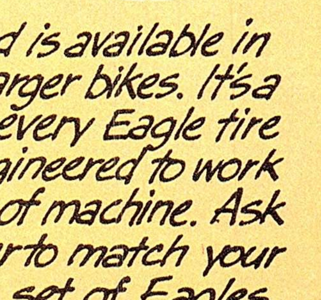
1. We started with a carcass built with four rugged plies of Triple-Tempered nylon to run long, cool and strong.



2. The Eagle G/T II includes the new bead retention feature that helps "lock" the tire on the rim in case it suddenly loses air pressure. Think about that. Like so many tire engineering advances, it's from Goodyear.



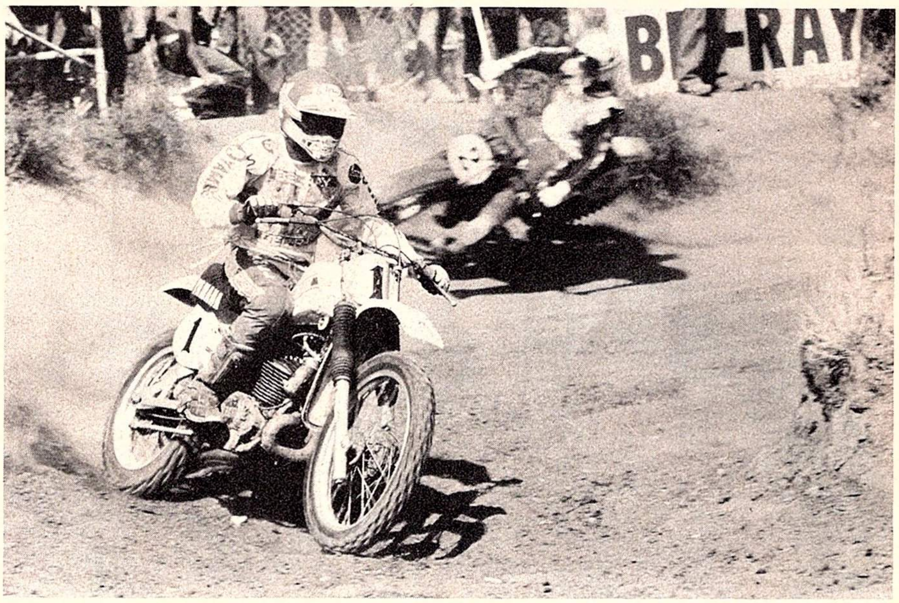
3. The Eagle G/T II is built with a constant tread radius design for smooth, predictable cornering and requires no special rim.



4. The Eagle G/T II carries a Goodyear speed rating of "H" and is available in tube-type sizes for larger bikes. It's a Goodyear Eagle and every Eagle tire is painstakingly engineered to work with a specific type of machine. Ask your Goodyear dealer to match your machine with a set of Eagles. They're built to run with the great designs.

GOODYEAR

CARLSBAD USGP .. *Continued from page 68*



500CC UNITED STATES GRAND PRIX

1.	Heikki Mikkola	Yam	(3-1)
2.	Herbert Schmitz	Mai	(1-3)
3.	Mike Bell	Yam	(4-5)
4.	Rick Burgett	Yam	(5-9)
5.	Gary Semics	C-A	(10-8)
6.	Tommy Croft	Hon	(9-10)
7.	Frank Stacy	KTM	(12-11)
	Gaylon Mosier	Kaw	(16-9)
8.	Hakan Andersson	Hus	(13-13)
9.	Brad Lackey	Hon	(DNF-2)
10.	Roger DeCoster	Suz	(2-DNF)
11.	Andre Malherbe	KTM	(DNF-4)
12.	Ken Adams	Mai	(16-14)
13.	Wayne Boyer	Suz	(18-12)
14.	Danny LaPorte	Suz	(6-DNF)
15.	Michael Kesseler	Yam	(15-16)
16.	Terry Clark	Mai	(DNF-6)
17.	Mike McIntosh	Yam	(17-15)
18.	Gerrit Wolsink	Suz	(7-DNF)
19.	Rex Staten	Yam	(DNF-7)
20.	Jaak Van Velthoven	KTM	(8-DNF)

season's pattern. Brad and Heikki pulled away from the pack strongly, while Schmitz moved into third some 25 seconds adrift of the leaders. Malherbe occupied fourth another eight seconds back. Lackey and Mikkola, racing in a holding formation, seemed to pace themselves for a late-moto sprint. Bell, DeCoster and Andersson held the crowd's attention with a bar-banging battle for fifth. The two grand prix veterans and the rookie American changed positions with every lap.

DeCoster's usual luck at Carlsbad—all bad—struck again. The throttle on Roger's Suzuki began to stick. He had to force the throttle slide closed everytime he wanted to shut-off. First, this small bother dropped him off the torrid pace of Bell and Andersson; later, the throttle stuck open in a turn and Roger crashed once more.

"It was getting pretty scary going into a turn and not knowing if your engine would respond (to the throttle) or not. Then in one turn I went to grab the front brake and the throttle stayed wide-open. It caused me to go very wide and I hit a hard rut and fell. This is just not my year. When I do well in one moto something happens and then I DNF."

About the same time that DeCoster retired, LaPorte went out too. Between motos, Pat Alexander, LaPorte's mechanic, replaced the works engine with a unit from last year's Trans-AMA campaign. In the hasty switch-over, the close fit between the clutch actuating arm and the case went unnoticed. After a bad start in the final moto, the arm began hitting the clutch side cover and this caused the clutch to slip and burn up. This time Danny was out.

Mike Bell, on the other hand, was going great guns. Although a rookie to the grand prix scene, Bell is no beginner to the demanding Carlsbad circuit with its baked adobe surface. Dicing with Andersson for fifth, Bell passed Hakan at the top of the big uphill just before the downhill jump. "We had traded the lead about six times. Just when I thought I had put a good move on him, he was right back in the next turn, trying to stick his bike up my inside. At the bottom of the uphill he squared off a turn and shut the door on me. I followed him up the hill; and when he went outside on the berm, I dived inside to get a straight drive at the first downhill jump. We were going so fast! Then just before he pulled in front of me again, he glanced back to see where I was. That split second cost him. He hit a slick spot and spun out. I didn't look back—I just started charging as hard as I could and tried to catch Malherbe."

With just 12 minutes remaining in the moto, Lackey closed on Mikkola and the duo picked up their pace in an all-out race to the finish. The spectators went berserk. Brad, desperate for championship points, charged to the limit and closed to within a half-second of Mikkola. Lackey tried to pass anywhere he could. On the uphill he took the slower outside line and held his 450 Honda in a full-lock powerslide trying to slip by the Finn. But Mikkola, riding with icy precision, held the frenzied Lackey in check. As the crowd waved the two on, Lackey pushed, probed, slithered and pressed, looking for passing space. Brad tried to force the World Champion into a mistake, but Mikkola refused to fumble.

> ". . . the moto finishes of Mikkola and Schmitz were identical: each had a first and third placing. So for the second year in a row, the timekeeper's table determined the overall winner. Mikkola, who had lost Carlsbad '77, was the time-watch winner in '78 . . ."

As the two flew down the drop-away just before the finish line for the checkered flag, Brad took his final long shot. He flew off the drop-away much farther than anyone had tried all day. When the Honda landed, the shock was tremendous; Lackey bounced into the air and into the last berm. He squared the berm and tried to nip Mikkola at the flag, but Mikkola held his line for the win. Over 30 seconds later Schmitz rolled in for third, heading Malherbe who contained Bell to fifth.

The moto finishes of Mikkola and Schmitz were identical: each had a first and a third placing. So for the second year in a row, the timekeeper's table determined the overall winner. The pressure of the Lackey/Mikkola duel resulted in a one-minute advantage for the Finn in overall time. Mikkola, who had lost Carlsbad '77 on time, was the time-watch winner in '78. Schmitz was second. Top American and third-place finisher was Mike Bell by virtue of his fourth- and fifth-place moto finishes. Teammate Rick Burgett followed with a fourth overall ahead of Semics, Croft and Stacy.

In the early years of the USGP, it was an honor to be the top American. Usually a sixth or seventh overall would have gained the honors. That's not true anymore. As a group, the American racers were much younger and faster this year, and many were racing their first grand prix. They were amazing. LaPorte's gritty first-moto performance was sensational. Bell worked his way through some of the most expensive motocross talent in the world in each moto for third overall. Burgett rode extremely well until his shift-lever problem slowed him. All these names were new to the European guests at Carlsbad. But they will be remembered for what they did in 1978 and what they will do in 1979. Because next year Carlsbad will be an *American*'s Grand Prix. ◉

©1978 R. J. REYNOLDS TOBACCO CO.

Salem Lights.
America's largest selling
low tar menthol cigarette.
More and more smokers prefer
the mellow flavor,
cooling menthol and
total satisfaction.

Salem Lights

Warning: The Surgeon General Has Determined That Cigarette Smoking Is Dangerous to Your Health.

LIGHTS: 11 mg. "tar", 0.8 mg. nicotine av. per cigarette, FTC Report AUG. '77;
LIGHT 100's: 11 mg. "tar", 0.9 mg. nicotine av. per cigarette by FTC method.

The world's best fairing just got painted your color.

That's right. Now you can order your Windjammer SS to color match any of the new super bikes… right down to the striping!

What's more, this year's Windjammer not only looks better, but incorporates several other refinements. Like new Fiamm horns which blast your presence on the road. And a new Bosch quartz-halogen headlight, with today's brightest beam. The optional CYCLE SOUND has been improved with larger speakers, and room for your favorite AM/FM, tape player, or CB. We've made further improvements on our windshield's venting system to allow smoother air flow.

From the dramatic Leading Edge Lights to the subtle innovations in our plug-in circuitry, no aspect of the Windjammer SS is less than State of the Art.

More than ever, our fairing represents the industry's most careful evolution of what a fairing ought to be.

Check it out. You'll find our Windjammer is just what your super bike needs. Now it's even in the same color.

Vetter
The first to do it right

MIC For a free brochure, see your Vetter dealer or write: Vetter Fairing Co., Rantoul, Illinois 61866. © 1978 Vetter Fairing Co.
Distributed in Canada by Marquette Corp., Ltd., 204 Yorkland Blvd., Willowdale, Ontario M2J1RS (416) 491-1777

CIRCLE NO. 52 ON READER SERVICE PAGE.